Investigating whether male sexual offenders in a high security hospital show an attentional bias towards offence related stimuli

Thesis

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ABSTRACT

This study was the first time a paradigm used to investigate attentional bias in emotional disorders had been applied to a sexually offending population within a high security hospital. The aims were to investigate whether sexual and non-sexual offenders display an attentional bias towards stimuli related to offending, and to explore whether sexual offenders differ from controls in the way their attention is allocated to non-offending sexual stimuli.

Sixty participants (15 sexual offenders against children, 15 sexual offenders against adult women, 15 non-sexual offenders, and 15 male members of staff) completed the probe detection task. Their task was to press a key to indicate the position of a dot probe that followed a neutral word or a 'target' word on a computer screen. The five categories of 'target' word were: stimuli related to sexual offending; stimuli related to non-sexual offending; stimuli related to non-offending sexual behaviour; stimuli related to sexual anatomy; and a 'neutral' set of stimuli related to travel.

All three groups of offenders showed non-significant attentional biases towards sexual offending stimuli. Considerable differences in individual participants' attentional bias scores were observed. The combined group of offenders displayed a trend, approaching significance, of 'attentional avoidance' of stimuli related to non-sexual offending. There was limited evidence that sexual offenders differ from male staff in their attentional processing of non-offending sexual stimuli.

The findings are interpreted, noting the significant methodological limitations of this pilot study. Clinical implications and ideas for future research are discussed. There is some potential for future clinical use of the dot probe paradigm but further research is required to facilitate the generalisation of findings to broader populations of sexual offenders.

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SECTION ONE

INTRODUCTION

Sexual offending constitutes a serious problem in western societies (Marshall, Anderson and Fernandez, 2000), and the need to understand what causes it to occur remains as urgent and compelling as ever (Ward, Keenan and Hudson, 2000). This paper applies a paradigm that has been used to investigate information processing in individuals with emotional disorders, to a population of sexual and non-sexual offenders within a high security hospital. This section begins by providing a background of how sexual offenders are defined, the difficulties in establishing prevalence rates of offending, and how offenders come to be housed in hospitals rather than prisons or the community. Theories that attempt to account for sexual offending are then introduced, along with a discussion of the limitations of current methods of assessment, and the need for new approaches to assessment. There follows a consideration of how techniques (i.e. the dot probe paradigm) that have been used to investigate information processing in emotional disorders, may be applied to explore attentional processes in sexual offenders. The section closes with an outline of the study's aims and hypotheses.

1.1 Background

There are difficulties in identifying the incidence and prevalence of sexual offending although it has been estimated that between 10 and 15% of females experience sexual abuse in childhood (Mullen, 1990), and that girls are abused at a ratio to boys of 9:1 (Cupoli and Sewell, 1988). Due to problems of under-reporting, however, these figures may not reflect the true prevalence. Estimates of the prevalence of rape vary

enormously; Epps (1996) cited studies indicating that the proportion of adult females reporting experiencing rape or attempted rape ranges from 9% to 44%. This may also be an underestimation as many sexual offences go unreported and only 10% of sexual offences known to the police actually result in a conviction (Lloyd and Walmsley, 1989). In the year 2000, 5200 people were convicted of sexual offences. Of those, 594 were for rape of a female and 2924 for indecent assault of a female. Approximately 850 were for sexual offences against children. The number of people found guilty in courts or cautioned for indictable sexual offences in 2000 was almost half the number seen in 1990 (Home Office, 2001).

There are problems in forming clear definitions of individuals who have sexually offended against children or adult women. Some researchers have attempted to form typologies of child sexual offender. Groth and Burgess (1977), for example, divided child sexual offenders into two groups, on the basis of the degree of force used in the offence, while Knight and Prentky (1990) classified offenders according to their degree of fixation and social competence. It has also been suggested that different motivational factors may lead an individual to offend, for example, emotional congruence with children, sexual arousal to children, or offending due to a lack of the heterosocial skills required to form relationships with adults (Epps, 1996).

Researchers have also attempted to identify homogeneous subsets of rapists. Knight and Prentky (1990) identified four types of rapist: opportunistic; pervasively angry; sexual (sadistic and non-sadistic); and vindictive. Groth and Burgess (1977) distinguished between the 'power rapist' who seeks to control and dominate, and the 'anger rapist' who seeks to express contempt and hate for women. As well as the difficulties in defining sexual offenders, differences exist with the profligacy of

offending. Some individuals may be defined as a sexual offender having committed one offence, while others may have a long and continuous history of offending. High levels of repetitive offending have been reported; Abel, Becker, Mittelman, Cunningham-Rathner, Rouleau, and Murphy (1987) found that just 561 rapists and child molesters reported carrying out over 200,000 sexual assaults on over 195,000 victims.

Sexual offenders constitute fewer than 1% of offenders convicted (Home Office, 2001), and most are not mentally disordered under the terms of the 1983 Mental Health Act (Epps, 1996). Those offenders who are considered to be suffering from a mental illness, psychopathic disorder, or to be mentally impaired, and are regarded as presenting a "grave and immediate danger" to the public (Mental Health Act, 1983) may be detained in one of the three high security hospitals in England and Wales, one of which is Broadmoor.

Psychologists in high security hospitals have a central role in assessing and treating sexual offender patients. Over the past two decades attempts have been made to develop comprehensive theories that attempt to account for the development and maintenance of sexual offending (Marshall et. al., 2000). Factors such as low self-esteem, intimacy deficits, problems empathizing with victims, deficits in social skills, cognitive distortions, and deviant sexual preferences have all been suggested as causal strands in the genesis of sexual abuse (Marshall, 1996). The assessment of these factors is crucial for formulating treatment plans and evaluating future risk to the public.

1.2 Cognitive distortions in sexual offenders

The cognitive-behavioural model of sexual offending proposes that cognitive factors are not seen as direct causes of deviant sexual behaviour, but as steps offenders go through to justify their offending, and serve to maintain the behaviour (Murphy, 1990).

Clinical reports and research has indicated that sexual offenders exhibit a range of cognitive distortions. Cognitive distortions refer to self-statements that allow offenders to deny, minimize, justify, and rationalize their behaviour (Murphy, 1990). Ward (2000) proposed that the cognitive distortions of sexual offenders are manifestations of 'implicit theories' they hold about people. Ward suggests that these 'theories' can be thought of as schemata guiding the processes of perception and interpretation of information. As a consequence they also serve to direct behaviour. Ward suggested that the 'implicit theories' of sexual offenders can be concerned with assumptions about people in general, theories about women and children, or specific beliefs about particular victims. Marshall et. al. (2000) commented that it is not the distorting processes that differentiate sexual offenders from the rest of the population; it is the content of their distortions, and the goals manifested by their behaviour, that differentiates them.

1.2.1 Cognitive distortions in sexual offenders against adult women

McFall (1990) argued that rapists have distorted cognitive schemata concerning heterosexual relations. He added that "these cognitive schemata predispose men toward sexual aggression by encouraging them to focus on ambiguous social cues from women; to misinterpret such cues as 'come-ons'; to believe that women will be

receptive to coercive sexual advances; and to perceive victims as desiring and deriving gratification from sexual assaults" (p. 318). Clinical lore espouses the view that rapists hold generally conservative and stereotyped attitudes towards women (Geer et. al., 2000), although empirical evidence has not consistently supported this view. Overholser and Beck (1986) failed to differentiate rapists from non-sex-offender inmates and college undergraduates on attitudes toward sexuality and rape myth acceptance, while Segal and Stermac's (1990) data suggested that rapists held similar attitudes towards women as that of non-sex-offender inmates and community-based males of similar socioeconomic status.

Current measures of attitudes, beliefs and perceptions about women tend to be transparent in the sense that it is apparent what the socially appropriate responses are (Marshall et. al., 2000). It is perhaps not surprising then that empirical studies have yielded inconsistent findings. Clinicians, however, have reported that sexual offenders' real beliefs, attitudes, distortions and minimizations are often elicited through interview and ongoing treatment sessions. Marshall et. al. (2000) reported that rapists are thought to harbour negative views of women, to endorse violence against women, and to accept rape myths. Several studies (e.g. Marolla and Scully, 1986; Seidman, Marshall, Hudson and Robertson, 1994) have discerned such views. Using the Multiphasic Sex Inventory (Nichols and Molinder, 1984; a measure of cognitive distortions), Barbaree (1991) found that 54% of rapists were in complete denial and a further 42% minimized some aspect of their offence.

1.2.2 Cognitive distortions in sexual offenders against children

Ward, Hudson and Marshall (1995) asserted that child molesters have distorted views on social interactions with others, particularly children, and perceive their interactions with children in a sexual manner. Abel, Gore, Holland, Camp, Becker and Rathner (1989) found that child sex offenders have beliefs that legitimize sexual involvement with children (revealing distortions such 'that sex between children and adults does not harm children'), and suggested that these beliefs function to maintain offending. They added that the distortions "appear to allow the offender to justify his ongoing sexual abuse of children without the anxiety, guilt and loss of self esteem that would usually result from an individual committing behaviours contrary to the norms of society" (p. 137). Barbaree (1991) found evidence of distortions on the Multiphasic Sex Inventory with 66% of child molesters showing denial and a further 33% minimizing their offence.

To summarize, research and clinical observations have highlighted that sexual offenders display certain cognitive distortions that have been hypothesised as serving to maintain offending, and there is evidence that the content of these distortions are different for rapists and sexual offenders against children.

1.3 Assessment of sexual offenders

A thorough assessment combines information from a diversity of methods. The main sources of data are collected through offender self-report via interview and questionnaires, behavioural observation and phallometric assessment (Epps, 1996). There are obvious difficulties in relying on measures of self-report when assessing sexual offenders. The purpose of self-report measures are generally transparent

(Tierney and McCabe, 2001), and offenders may lie, deny, or make errors when being interviewed or completing questionnaires. There is a need for measures that are objective, difficult to manipulate and closed to social desirability bias, and which may provide some form of reliability check of the offender's report.

Phallometric assessment with the penile plethysmograph (PPG) is used to measure deviant sexual preference in offenders. The rationale for this is based on early conceptualizations that viewed conditioned sexual preferences to be the basis of sexual offending (Marshall, 1996). The PPG apparatus consists of a transducer that senses changes in penile erection when the individual is presented with different stimuli. PPG output cannot prove the guilt of the patient but Marshall and Eccles (1991) reported its clinical use in providing results to confront patients whom initially claimed innocence. There are, however, ethical reservations in using this technique and questions have been raised regarding its reliability and validity (Marshall, 1996). Specialist training is also required to administer the PPG and its availability is limited; a survey by Houston, Thomson and Wragg (1993) revealed that only 13.7% of forensic psychologists in England and Wales had used the technique over the course of a year.

Current methods of assessing sexual offenders clearly have their limitations and Sinclair (1991) reported that there is no research evidence that mental health professionals can accurately differentiate sexual offenders from non-sex offenders on the basis of psychological assessment. Clinically it would be useful to distinguish between sexual and non-sexual offenders in order to identify targets for treatment and to examine the effects of treatment. In terms of assessing future risk from the

offender, the ability to distinguish sexual from non-sexual offenders would surely inform this process. Clearly there is a need for the development of new tools for assessing sexual offenders.

1.4 What is attentional bias?

1.4.1 Processing Biases in Emotional Disorders

Cognitive models propose that how individuals process and attend to emotional information may be a causal factor in the development and maintenance of emotional disorders (Mathews and MacLeod, 1994). Biases in attention occur when individuals shift their attention towards stimuli in the environment that is representative of their concerns. This phenomenon is thought to occur because the salient stimuli 'captures attentional resources' (Williams, Watts, MacLeod and Mathews, 1997). Examples of 'attention to salient material' are not limited to psychopathology; for example, a person buying a house may find themselves drawn to 'For Sale' signs (Williams et. al., 1997).

The most common framework used to explain attentional bias is Beck's schema theory (Beck, Emery, and Greenberg, 1985). Within this framework, material that is salient to an individual is said to attract disproportionately more processing resources; this is due to the activation of specific knowledge structures ('danger schemata') that represent (for example, for individuals with anxiety disorders) personal threats. These schemata that comprise long-term memory contain propositional information that may be thought of as rules, assumptions or formulae, and play an active role in organizing the constant inflow of new information (Brewin, 1993). Once a schema is activated it

influences the subsequent selection of stimuli to be attended to. For example, an individual with a fear of flying has a 'danger schema' that contains the information that flying is dangerous, and may find that when reading a newspaper their attention is drawn or biased towards an article detailing a plane crash. Following schema activation, an individual's appraisal of a feared situation is characterized by negative automatic thoughts about danger. The processing biases associated with schema activation maintain the individual's belief in negative automatic thoughts, assumptions and beliefs by distorting interpretations in a manner that is consistent with dysfunctional beliefs and appraisals.

1.4.2 Experimental tasks that have assessed attentional bias

The most commonly used task to investigate attentional bias is the STROOP paradigm (Stroop, 1935). Participants are required to name the colour of words presented to them, while attempting to ignore the word itself. Studies have provided strong confirmation, across a wide variety of psychopathologies (for example, spider phobia, Lavy, van den Hout and Arntz, 1993; obsessive-compulsive disorder, Foa, Ilai, McCarthy, Sshoyer and Murdock, 1993; rape victims with post-traumatic stress disorder, Foa, Feske, Murdock, Kozak and McCarthy, 1991; and depression, Gotlib and McCann, 1984), that latency to name the colour in which an emotional word is printed is increased in people who are emotionally disturbed (Williams et. al, 1997). These findings have been explained as being due to the interference of the salient words. In the above examples the 'emotional words' that produced interference were specific to the individuals' concerns i.e. 'spider words' for the spider phobics, 'contamination words' for the obsessive-compulsive patients, 'rape words' for the

post-traumatic stress disorder sufferers, and 'depressive words' for the depressed patients.

The STROOP paradigm, however, has been criticized as a measure of attentional bias. It has been pointed out that increased colour-naming interference on negative words need not reflect increased attention to the content of such aversive stimuli (MacLeod, Rutherford, Campbell, Ebsworthy and Holker, 2002), and it is widely accepted that a number of different cognitive mechanisms might contribute to performance on the STROOP (MacLeod, 1991). For example, 'late selection' accounts suggest that STROOP interference may not necessarily occur at the input stage of information processing, but at a later response stage, after memory retrieval. It has also been suggested that threat distractors, for example, may attract the same attentional resources in anxious and non-anxious subjects, but the anxious subject's perception of this stimulus may increase their anxiety and impair their performance on the timed task (Mogg, Mathews, and Eysenck, 1992). A further problem in interpreting the STROOP is that the 'to be selected' (i.e. the word colour) and the 'to be ignored' (i.e. the word) components of the display are integrated into the same perceptual object. Broadbent (1982), for example, found that differences that are due to where attention is focused are reduced when such integrated stimuli are used.

1.4.3 The dot probe paradigm

The dot probe paradigm overcomes the interpretative problems of the STROOP by requiring the subject to make a neutral response in the form of a button press to a neutral stimulus in the form of a visual dot probe. It also allows a test of the prediction

that the presence of a 'threatening' term can both facilitate and impair dot detection, in the same individual, depending on the threat word's position relative to the dot. No general explanation in terms of arousal or performance efficiency can accommodate such directional effects (MacLeod, Mathews and Tata, 1986). The dot probe paradigm provides a more direct source of evidence of attentional bias than the STROOP as it enables direct measurement of how visual attention is distributed. This tool was first used by MacLeod et. al. (1986) to investigate whether clinically anxious subjects shift attention towards threatening words. The technique involved briefly presenting pairs of stimuli (i.e. a threat word and a neutral word) on a computer screen. Participants were required to detect a visual probe, which could have appeared in the spatial location of either word, immediately after the display of that word was terminated. The probe was a small dot and participants were required to press a hand-held button immediately when they detected the dot. The rationale for the task was that response latencies to probes would be faster if they occurred in an attended, rather than unattended, region of the display.

MacLeod et. al. found that clinically anxious subjects consistently shifted attention towards threat words, whereas non-anxious subjects tended to shift attention away from such material. This supported their hypothesis (and Beck's schema theory of emotional disorders) that anxious subjects display an attentional bias towards threat-related stimuli.

Attentional biases were subsequently observed in populations of non-clinical participants who reported high levels of trait anxiety (Broadbent and Broadbent, 1988). Mogg et. al. (1992) replicated MacLeod et. al.'s findings in patients with

generalized anxiety and a review by Mathews and MacLeod (1994) cited considerable evidence that vulnerability to anxiety is associated with an attentional bias that operates to favour the processing of emotionally negative information. Similar attentional biases (using the dot probe paradigm) have subsequently been found within populations suffering other forms of anxiety pathology, such as social phobia (Asmundson and Stein, 1994), obsessive-compulsive disorder (Tata, Leibowitz, Prunty, Cameron and Pickering, 1996), post-traumatic stress disorder (Bryant and Harvey, 1997) and panic disorder (Kroeze and van den Hout, 2000).

There has been less consistent support for the hypothesis that depression would be associated with a bias towards negative information (Bradley, Mogg and Lee, 1997). Findings in favour of this attentional bias have been reported by Mathews, Ridgeway and Williamson (1996), Mogg, Bradley and Williams (1995) and Bradley et. al. (1997), but Hill and Dutton (1989) and MacLeod et. al. (1986) failed to find evidence of such biases in non-clinically and clinically depressed subjects respectively.

Westra and Kuiper (1997) extended their thinking beyond the domains of depression and anxiety to investigate whether selective attention for certain kinds of idiosyncratic information may be related to different forms of maladjustment. Beck and Clark's (1988) content-specificity hypothesis posited that differences in the expression of maladjustment may be directly linked to the ideational content of various cognitions. Westra and Kuiper's study focused on individuals with depression, who endorsed self-disparaging cognitions related to loss and hopelessness, anxious individuals, whose concerns were related to their perceived threat of social disapproval, individuals with bulimia, who demonstrated overvalued ideas regarding the

importance of weight and shape, and 'Type A' individuals who specifically endorsed irrational cognitions pertaining to achievement and competition. They found that, on the dot probe paradigm, individuals with depression, anxiety and bulimia demonstrated an attentional bias towards personal adjectives that were hypothesized to be of specific relevance to their underlying cognitive concerns.

Keogh, Ellery, Hunt and Hannent (2001) applied the dot probe paradigm to a sample of pain sufferers. They found that those with a high fear of pain exhibited an attentional bias towards pain-related information, compared to those classified as low in the fear of pain. They related these findings to the literature regarding processing biases in anxiety disorders and implicated the need for cognitive behavioural interventions to address such biases.

The dot probe task has further been applied within an addictions setting. Cognitive theories of addiction propose that drug-related stimuli capture attentional resources (contributing to dependence and relapse), and Townshend and Duka (2001) found that heavy social drinkers showed an attentional bias towards alcohol-related pictures in comparison with occasional drinkers.

Mogg, Bradley, Hyare, and Lee (1998) demonstrated that attentional biases may be a feature of biologically-oriented drive states. They found that subjects with high levels of hunger showed an attentional bias for food-related words in comparison with those with low hunger. This indicated that attentional biases may not be specific to emotional states and questioned whether they may be a feature of other motivational states.

1.5 Applying the dot probe paradigm to a forensic population

To the researcher's knowledge there are no previous examples in the literature of the dot probe paradigm being applied to offending populations.

Drawing on the cognitive behavioural model of sexual offending, it seems plausible to hypothesise that sexual offenders may demonstrate attentional biases towards stimuli that are salient to their schemata content in a similar way to that has been demonstrated in individuals with emotional disorders. Ward, Hudson, Johnston and Marshall (1997) suggested that sexual offenders use specific information processing styles, that is, they interpret information and make causal attributions in a fashion that is consistent with their beliefs. Indeed, Geer, Estupinan and Manguno-Mire (2000, p.122) recommended that "there is much to be learned by applying the paradigms and insights from the information processing approach [to emotional disorders (including attentional factors)] to the sex offender".

1.6 Aims and Hypotheses

Geer et. al. (2000) highlighted the need for more rigorous empirical approaches to evaluate the distorted cognitions of sexual offenders, and commented that "clinical lore seems to be where many stop in their discussion of the mental processes that play a role in sex offending" (p. 114).

Given the evidence that sexual offenders show distorted beliefs with regards to sexual offending, it could be hypothesised that stimuli related to sexual offending may be salient to the sex offending individual. The cognitive model would suggest that the

salient stimuli would activate the individual's schema related to sexual offending, and attract attentional resources. The first aim of the study is therefore as follows:

1) Do sexual offenders who have committed offences against adult women and sexual offenders who have committed offences against children demonstrate an attentional bias towards stimuli that are related to sexual offending?

Hypothesis One- Sexual offenders who have offended against children and sexual offenders who have offended against adult females will show an attentional bias towards stimuli that are related to sexual offending.

Null Hypothesis- There will be no difference in sexual offenders' response towards sexual offending and neutral words.

Drawn from the criminological literature, Yochelson and Samenow's (1977) description of the 'criminal personality' proposed that individuals who engage in criminal behaviour show lifelong patterns of distorted thinking and perception, that are causally related to offending. This cognitive theory is based on the claim that offenders have a unique set of cognitive patterns, so-called 'criminal thinking patterns' that are said to be erroneous according to the logic or patterns of 'responsible thinking' (Finckenauer and Kochis, 1984). Given these distortions, the second aim of the study explores whether offenders in general show an attentional bias towards stimuli related to general offending.

2) Do offenders demonstrate an attentional bias towards stimuli that are related to offending?

Hypothesis Two- Sexual and non-sexual offenders will show an attentional bias towards stimuli that are related to non-sexual offending.

Null Hypothesis- There will be no difference in sexual and non-sexual offenders' response to neutral stimuli and stimuli that are related to non-sexual offending.

Geer et. al. (2000) suggested that "determining whether sex offenders differ from normals in the way in which they interpret and process sexual information could be a useful approach to examine the basic processing of sexual information in these individuals", and that "using approaches from information processing and the applied cognitive literature could be useful in exploring these issues" (p. 114). Attentional variables in sexuality have begun to be investigated experimentally (Geer and Manguno-Mire, 1996), and it has been suggested (though not without debate) that attentional focus on sexual stimuli is a pre-requisite for sexual arousal (Geer and Fuhr, 1976). Cranston-Cuebas and Barlow (1990) proposed that problems with attention form the substrate upon which many sexual dysfunctions develop. They suggested that during a sexual interaction, dysfunctional males are characterized by their attention to non-sexual thoughts, leading to distraction from the appropriate erotic stimuli, and a decrease in arousal. Geer and Manguno-Mire (1996) anticipated that methodologies available from the information processing approach will enhance knowledge of the mechanisms that underlie problematic sexuality (e.g. sexual assault and child sexual abuse). Geer and colleagues' work, exploring how sexual

information is processed, led them to identify a phenomenon termed 'Sexual Content Induced Delay' (SCID) (Geer and Manguno-Mire, 1996). This refers to the tendency of subjects to respond more slowly in identifying a stimulus when there is an erotic element present. Geer and Lapour (1990) examined gender differences in attentional resource allocation to erotic, romantic, and neutral stimuli using the dot probe methodology. It was found that the SCID phenomenon was replicated, and although the evidence was not conclusive, individuals appeared to shift attention away from sexual stimuli.

The final aim of the study was to explore whether sexual offenders, in comparison with non-sexual offenders and male controls, demonstrate an attentional bias towards or away from non-offending sexual stimuli. No prediction is made as to the hypothesized direction of any bias as there is a dearth of previous research to inform such a statement.

3) Do sexual offenders, non-sexual offenders, or male staff show an attentional bias towards or away from non-offending sexual stimuli?

Hypothesis Three- Sexual offenders will differ from non-sexual offenders and male staff in their attentional bias scores for neutral stimuli and stimuli related to non-offending sexual behaviour.

Null Hypothesis- There will be no difference between sexual offenders, non-sexual offenders, and male staff in their attentional bias scores for neutral stimuli and stimuli related to non-offending sexual behaviour.

Hypothesis Four- Sexual offenders will differ from non-sexual offenders and male staff in their attentional bias scores for neutral stimuli and stimuli related to sexual anatomy.

Null Hypothesis- There will be no difference between sexual offenders, non-sexual offenders, and male staff in their attentional bias scores for neutral stimuli and stimuli related to sexual anatomy.

1.7 Methodological Considerations

The methodological issues arising from meeting these aims included the selection of participants for the comparison groups (and an awareness of their medication levels), the selection of stimuli for the task, the design of the probe detection task, and the choice of 'paper and pen' measures to be administered.

1.7.1 Selection of participants

Given that research has indicated that sexual offenders against children hold different cognitive distortions to rapists it seemed theoretically valid to compare this distinct group of offenders. As some studies have found it difficult to differentiate the beliefs of incarcerated rapists from men in the general prison population and many males in the general population (Ward et. al, 1997), two comparison groups of non-sexual offenders within the high security hospital, and male members of staff were chosen.

1.7.1.2 Medication levels of particpants

The researcher was aware that some patients within the hospital were prescribed medication that may have slowed their reaction times. However, as attentional bias scores were calculated separately for each individual, it was agreed that such medication would not influence the direction of any potential biases.

1.7.2 Selection of stimuli

Initially the researcher planned to develop a group of target words specific to sexual offending against children and a group of target words specific to sexual offending against adult women. However, it was not possible to devise enough distinct terms to pursue this plan (the difficulties associated with establishing an appropriate list of stimulus words are considered further in the discussion), so alternative groups of stimuli were produced, and the decision was made to additionally explore whether sexual offenders show a bias towards or away from non-offending sexual stimuli. The 'neutral' 'travel' category of words was included in the study to control for the possibility that significant findings might have been due to a bias towards words that fit into a category.

1.7.3 Design of probe detection task

Earlier versions of the probe detection task (MacLeod et. al., 1986) used a probe on only a proportion of trials, and required participants to judge whether a probe was present or not. More recently, Mogg and Bradley (1999) noted two disadvantages of this version of the task. Firstly, as most trials were not probed, emotionally disordered individuals were finding it difficult to sustain concentration over the long, tedious task. Secondly, as probes were more likely to occur on trials with threat words, the presence of the threat word was serving as a warning cue for probes, thus complicating interpretation of results.

To eliminate these difficulties, Mogg and Bradley (1999) developed a forced-choice version of the task, based on that used by Posner, Snyder and Davidson (1980, Experiment 3). Every trial was probed, with the probe replacing one of the two stimuli, and the participants were required to judge which position the probe appeared in. A potential disadvantage with this version is that participants may adopt a strategy of attending to one region of the display more than another, thus making the task less sensitive to attentional bias. However, using tasks in which every trial was probed, Mogg and colleagues (e.g. Bradley, Mogg, Falla and Hamilton, 1998) have demonstrated the kinds of attentional biases that have been found in earlier versions of the task.

1.7.4 Choice of measures

The Beck Depression Inventory Second Edition (BDI-II, Beck, Steer and Brown, 1996), the Spielberger State-Trait Anxiety Inventory (STAI, Spielberger, Gorsuch, Lushene, Vagg and Jacobs, 1983), and the Mill Hill Synonym Test (Raven, 1965), were all administered in MacLeod et. al.'s original study with the dot probe paradigm. Previous research has linked depression with an attentional bias towards negative emotional stimuli, therefore it was important to administer the BDI-II to control for levels of depression across the comparison groups. It has been consistently found that individuals with anxiety (and non-clinical participants reporting high levels of trait anxiety) display attentional biases towards emotionally negative stimuli (MacLeod et. al., 2002). The STAI was therefore used to compare state and trait anxiety levels between groups. Given that the experimental task involved presenting pairs of words, it was important to compare verbal intelligence between groups. The Mill Hill Scale was used for this purpose.

SECTION TWO

METHOD

2.1 Participants

2.1.1 Selection of control participants.

Fifteen male members of hospital staff were required to be control participants in the study. All were required to speak English as their first language and have clinical contact with patients, thus being exposed to forensic case material. Twenty staff from a range of wards within the hospital were randomly approached to ask if they were interested to take part. After reading the 'control' information sheet, five members of staff declined to take part. All fifteen members of staff who gave consent to participate worked as either nurses or care assistants on the wards. Of those, one was a student nurse, two were 'A' grades, one was a 'B' grade, three were 'C' grades, two were 'D' grades, four were 'E' grades and two were 'F' grades. Eight separate wards were represented by the participants. Twelve of the participants worked on male wards and three worked on female wards.

2.1.2 Selection of patient participants.

Three separate groups of male patient participants were required for the study. These were 1) patients who had committed sexual offences against children, 2) patients who had committed sexual offences against adult women but had not sexually offended against children and 3) patients who had committed non-sexual offences and had no previous history of sexual offending. All participants had to have English as their first language and due to the nature of the experimental task, any participants for whom previous assessments had highlighted reading difficulties were not considered.

To initially identify possible participants who met the above criteria, psychologists within the hospital psychology department were approached. The hospital files of those patients identified were consulted to confirm that they fulfilled the criteria for one of the three participant groups. A letter was then sent to the respective clinical teams for each patient to request their permission to approach the patient. (See Appendix One).

Permission was requested to approach sixty-six patients. The clinical teams did not give permission to approach two (0.03%) patients. This was because their nursing care plans recommended non-participation in research. Before approaching potential participants on their wards, the researcher checked with the nursing team on duty that it was an appropriate time to visit the ward.

Sixteen patients (who had committed sexual offences against children) from seven different wards were approached and asked to read the 'patient information sheet'. Fifteen (93.8%) agreed to participate in the study. One (6.2%) declined to take part in the study having read the information sheet.

Thirty patients (who had committed sexual offences against adult women) from nine different wards were approached and asked to read the 'patient information sheet'. Fifteen (50%) agreed to participate in the study. Six (20%) declined to take a look at the information sheet and nine (30%) declined to take part in the study having read the information sheet.

Eighteen patients (who had committed non-sexual offences) from five different wards were approached and asked to read the 'patient information sheet'. Fifteen (83.3%) agreed to participate. One (5.6%) declined to take a look at the information sheet and two (11.1%) declined to take part in the study having read the information sheet.

2.2 Materials

2.2.1 Design of probe detection task.

The probe detection task was based on the 'forced-choice' version developed by Mogg and Bradley (1999). The current study consisted of 104 trials. Each trial began with the presentation of an X in the centre of the computer screen for 750 milliseconds (ms). Then a pair of words appeared, one above the other, for 500ms. (This is the typical presentation time used in previous dot probe studies with adult participants). Immediately after the words disappeared, a dot probe appeared in the location of one of the words. The participants' task was to press one of two keys to indicate the location of the dot probe. The probe remained on the screen until the participant gave a response (with a maximum of ten seconds), and their reaction time (probe detection latency) was recorded. The next trial followed immediately.

Two trials at the beginning and two at the end of the task were buffer trials, presenting neutral word pairs. The remaining 100 trials contained a word related to sexual offending, or a word related to non-offending sexual behaviour, or a word related to sexual anatomy, or a word related to non-sexual offending, or a word related to travel, paired with a neutral word. These trials were set up to yield a 5x2x2 within-participants design with the following independent variables: *word type* (one fifth of the target words were related to sexual offending, one fifth were related to non-

offending sexual behaviour, one fifth were related to sexual anatomy, one fifth were related to non-sexual offending and one fifth were related to travel), *word* position (half the target words appeared in the upper part of the screen, and half in the lower part), and *probe position* (half the probes appeared in the upper part of the screen, and half in the lower part). That is, five of each of the five categories of target words appeared in each of the following four combinations: upper target word followed by upper probe; upper target word followed by lower probe; lower target word followed by upper probe; lower target word followed by lower probe.

2.2.2 Stimuli for probe detection task.

The target words used as stimuli in the probe detection task are shown in Appendix Two[1]. Twenty words related to sexual offending, twenty related to non-offending sexual behaviour, twenty related to sexual anatomy, twenty related to non-sexual offending, and twenty words related to travel. The 'sexual' words and those related to offending were chosen from a number of sources; A variety of literature regarding offending was consulted as were a number of psychologists with experience of working with offenders, and a professor the Ethics Committee recommended contacting. Once a list of possible stimuli was produced, it was circulated to members of the hospital psychology department to acquire their opinions as to whether the words fitted into one distinct category, and if the words would be familiar to potential participants. Twelve psychologists fed back comments and words that did not satisfy the above criteria were excluded. Words for the 'travel' category were taken from previous unpublished research (Murphy, 1993). All 'target' words used in the study can be found in the Chambers English Dictionary (1992).

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[1] The targets words used in the probe detection task are included in the Appendices rather than the Method section because some of the words may be offensive to some people.

Each target word was matched with a neutral word for length, and verbal and written frequency of usage in the English language. The Brown Verbal Frequency and Kučera-Francis written frequency ratings were taken from the MRC Psycholinguistic Database (1987). Words that had no data for verbal frequency were matched for written frequency and vice versa. Words that were used with such low frequency that they had no reported written or verbal frequencies were matched with words of the same length without reported frequencies. See Appendix Three for the neutral words matched to each target word, and their respective frequencies. In addition to the target word pairs, 14 pairs of neutral words (matched for length and frequency) were taken from previous research (Murphy, 1993). Ten of these neutral pairs were used for practice and the other four pairs were used in buffer trials. These are shown in Appendix Four.

2.2.3 Apparatus for probe detection task.

The computer task was presented on a Dell Inspiron 7500 laptop PC, with a 305mm x 230mm screen, using the Super Lab Pro 2.0 software (Cedrus Corporation, 1999) and the PC's multimedia timer (accurate to 1ms). Word pairs were presented in the centre of the screen against a black background, in white Arial block capitals, approximately 8mm high and separated vertically by 53mm. The 'T' key was used to respond to the upper probe and the 'B' key for the lower probe. The 100 target trials were presented in random order.

2.3 Measures

2.3.1 Demographic Information.

The control participants' age and job title/grade were collected. For patient participants their age, diagnosis and length of stay in the hospital were collected from their Ward file.

2.3.2 Written Measures.

In addition to the probe detection task all participants were given three written measures to complete. These were the BDI-II, Beck et. al. (1996), the STAI, Speilberger et. al. (1983), and the Mill Hill Synonym Test, Raven (1965).

2.3.2.1 BDI-II (Appendix Five).

The BDI (Beck, Ward, Mendelson, Mock and Erbaugh, 1961) has been demonstrated to have high internal consistency, good concurrent validity, and has been shown to discriminate between depressed and non-depressed individuals (Beck, Steer and Garbin, 1988). The BDI-II represents a refinement of the original measure and has been shown to have improved internal consistency. Test-retest reliability and the validity of the scale remain high (Beck et. al., 1996).

2.3.2.2 STAI (Appendix Six).

The STAI has been used extensively in research and clinical practice, and has been demonstrated to have sound psychometric properties (Spielberger and Vagg, 1984). The State Anxiety Scale has been found to be a sensitive indicator of changes in transitory anxiety, and has been used extensively to assess anxiety induced by experimental procedures. In experimental research, the Trait Anxiety Scale has

proven useful for identifying individuals with high levels of neurotic anxiety (Spielberger et. al., 1983).

2.3.2.3 Mill Hill Scale (Appendix Seven).

Participants were administered the synonyms section of the Mill Hill Scale (Set B). From this it is possible to obtain an estimate of IQ (Peck, 1970). For the purposes of comparing groups in the current study the raw scores were used (Mathews, Mogg, May and Eysenck, 1989).

2.4 Procedure

Potential participants were initially approached with an information sheet giving them a brief outline of what taking part would involve. (See Appendix Eight for control and patient information sheets). A consent form was attached to each information sheet. Those people approached who were willing to participate were asked to sign the consent form. Confidentiality was assured for all participants although patients had the option of having their findings shared with their clinical team if they wished. (See Appendix Nine for control and patient consent forms). It was stated on the patient information and consent forms that participation was optional and that their decision to choose or decline to take part would in no way affect their future treatment.

Once the consent forms were signed an appointment was made to visit the participant on their ward. Initially participants were given the BDI-II, the STAI and the Mill Hill Synonym Scale to complete. Participants were then placed in front of a lap-top computer screen and asked to follow the following interactive instructions displayed on the computer screen.

"In this task you are going to see words presented on the screen in pairs. You will see an X in the centre of the screen that I would like you to look at. Press the space bar to see an X now". (An X appeared briefly). "After about a second the X will disappear. Then you will see two words in the middle of the screen, one above the other. Press the space bar now to see some words". (A neutral word pair appeared briefly). "After about half a second, the words will disappear. Then you will see a small dot where the top word was or where the bottom word was. Press the spacebar now to see a dot". (A dot probe appeared in the upper position briefly). "That dot was where the top word was. When you see a dot where the top word was, press T as fast as you can. Press the space bar now to see the dot again. Remember to press T as fast as you can when you see the dot". (The upper dot probe reappeared. Feedback was given to participants according to their response, either, 'Good, that's right!', or 'Bad luck, wrong key!', or if the participant did not respond within 10 seconds, 'Sorry too slow.') "You could also see a dot where the bottom word was. When you see a dot where the bottom word was, press B as fast as you can. Press the space bar now to see a dot where the bottom word was. When you see it, press B as fast as you can". (A dot probe appeared in the lower position. Feedback was given according to their response as before). "Remember this is what you have to do. 1. Look at the X when you see it in the middle of the screen. 2. When you see a dot where the top word was, press T as fast as you can. 3. When you see a dot where the bottom word was, press B as fast as you can."

Participants were then asked to practice for ten trials. Feedback was given following each trial. Participants were encouraged, particularly if responding slowly, to sit with

two fingers poised over the response keys. After the practice the participant was told that when the main task begins they would not be given feedback as to whether or not they had pressed the correct key. The instructions were then shown on the screen again as a reminder. When they were ready to commence the main task, participants were asked to press the space bar. The 104 trials of the experimental task were then completed in a single block with no breaks. This took approximately four minutes. Following the completion of the task participants were asked if they had any comments or questions and thanked for their participation. Control participants were debriefed regarding the purpose of the experiment but their individual performance was not shared and remained confidential.

2.5 Ethical Considerations

An application outlining the study's rationale, aims and methodology was made to the High Security Hospital Ethics Committee. The Committee requested a number of minor changes to the initial proposal before the Chairman of the Ethics Committee was able to take action for the study to proceed. This was predominantly related to the wording of the information and consent forms. (See Appendix Ten for the final letter from the Ethics Committee giving permission for the study).

2.6 Data Analysis

To prepare the data for analysis, mean probe detection latencies were calculated (after deleting incorrect responses and response latencies >2000ms, to reduce the influence of outliers) for each of the twenty combinations of within-participant variables. Attentional bias scores were then calculated separately for each individual for each of the five groups of target words, using the following formula (taken from MacLeod and Mathews, 1988):

$$\frac{(UP/LT - UP/UT) + (LP/UT - LP/LT)}{2}$$

where UP/LT corresponds to the mean detection latency for upper probes when preceded by a lower target word, and so on. This equation calculates the mean speeding of detection latencies to probes in the same area as the target word by subtracting them from equivalent probe detection times when the target word is in a different location. Essentially the calculation simplifies the relationship between target word position X dot probe position in order to facilitate the interpretation of findings. It will result in a value of zero if position of the target word exerts no differential influence upon the detection latencies for probes in either area. Positive attentional bias scores represent speeded processing of the target word, while negative scores suggest that participants moved attention away from the area where the target word appeared.

SECTION THREE

RESULTS

3.1 Demographic Information

All participants' ages were recorded. For patient participants, their diagnosis and length of stay in the hospital was noted. Table 3.1 summarizes this information.

Table 3.1 Demographic information for the four participant groups

	Male members of staff (N=15)	*Sexual offenders against children (N=15)*	*Sexual offenders against adult women (N=15)*	*Non-sexual offenders (N=15)*
AGE **Mean** **(SD)** **Range**	**34.9 years** (9.02) 21-49 years	**37.7 years** (9.14) 24-58 years	**41 years** (10.38) 23-56 years	**32 years** (6.35) 24-43 years
DIAGNOSIS **Mental Illness** **PPD**		**6** **9**	**8** **7**	**9** **6**
LENGTH OF STAY **Mean** **(SD)** **Range**		**94.5 mths** (43.92) 35 – 190 mths	**107.1 mths** (49.77) 23 – 189 mths	**79.3 mths** (31.77) 28 – 148 mths

SD= Standard Deviation. PPD= Psychopathic Personality Disorder. Length of stay refers to the amount of time since the individual was admitted to the hospital. Mths= months.

A Kolmogorov- Smirnov analysis revealed that the age data for all four groups of participants was normally distributed ($p>0.3$). The assumption of homogeneity of variance was also satisfied ($p>0.4$). An ANOVA (with age as the dependent variable and the four participant groups as the independent variables) revealed that the mean ages between groups were found to be significantly different ($F_{(3,56)} = 2.841$, $p<0.05$). Post-hoc (Scheffe) comparisons indicated that the mean age of the 'sexual offenders against adult women' group was significantly greater than that of the non-sexual offending group ($p<0.05$). Assumptions of normal distributions ($p>0.5$ in all groups)

and homogeneity of variance ($p>0.4$) were satisfied for the 'length of stay' data for all three patient groups. An ANOVA (with length of stay as the dependent variable and the three patient groups as the independent variables) revealed no significant differences between groups in terms of their mean length of stay in the hospital ($F_{(2,42)}=1.61$, $p>0.21$). With regards to the diagnoses of patient participants, a Chi-Square analysis revealed that these between group differences were not significant ($X^2_{(2)}= 1.25$, $p>0.5$).

3.2 Written measures

The mean scores for each group on the three written measures administered are summarized in Table 3.2.

Table 3.2 Summary of the written measures for the four groups

	Male members of staff (N=15)	*Sexual offenders against children (N=15)*	*Sexual offenders against adult women (N=15)*	*Non-sexual offenders (N=15)*
BDI				
Mean	**5**	**15.3**	**14.4**	**14**
(SD)	(4.83)	(11.88)	(7.93)	(8.58)
Range	0-15	0-40	0-30	0-29
STAI State Anxiety				
Mean	**30.1**	**35.1**	**34.9**	**30.4**
(SD)	(6.83)	(13.6)	(10.51)	(9.8)
Range	22-46	20-65	20-55	20-51
Trait Anxiety				
Mean	**33.4**	**43.9**	**40.3**	**38.6**
(SD)	(6.6)	(15.76)	(10.50)	(10.41)
Range	22-45	22-75	24-65	20-57
Mill Hill				
Mean	**28.3**	**29.2**	**28.3**	**26.4**
(SD)	(3.08)	(3.97)	(6.75)	(4.45)
Range	22-34	23-38	16-41	19-34

SD= Standard Deviation. BDI= Beck Depression Inventory. STAI= Spielberger State-Trait Anxiety Inventory. Mill Hill= Mill Hill Vocabulary Scale, Synonym Section.

Kolmogorov- Smirnov analyses revealed that the data for BDI, State Anxiety, Trait Anxiety and Mill Hill Scale for all four groups of participants were normally distributed ($p>0.3$ in all cases). A series of ANOVAs[2] were performed with BDI score, State Anxiety score, Trait Anxiety Score, and Mill Hill Score as the dependent variables and the four participant groups as the independent variables. The BDI scores ($F_{(3,56)} = 4.610$, $p<0.01$) were found to be significantly different. Post-hoc (Scheffe) comparisons indicated that the BDI scores of the three offending groups were significantly higher than the non-offending control group ($p<0.05$ for all three comparison groups). For the staff group, the mean BDI score fell into the 'normal range' of mood disturbance, while for the three patient groups the mean BDI score fell into the category of 'mild mood disturbance' (Beck et. al, 1996). There were no significant differences between the groups on the remaining three measures.

[2] The assumption of homogeneity of variances was not satisfied at a level that would have been desirable ($p<0.3$ for each scale), but ANOVAs are robust to deviations from normality (Games and Lucas, 1966) and, to a lesser extent, violations of the assumption of equality of variance (Howell, 1987). It was therefore decided to proceed with a parametric test. However, a non-parametric test was also conducted. This (Kruskal-Wallis test) revealed the same finding, i.e. only the mean BDI scores between groups significantly differed ($X^2_{(3)}=12.648$, $p<0.01$).

3.3 Attentional Bias Analyses

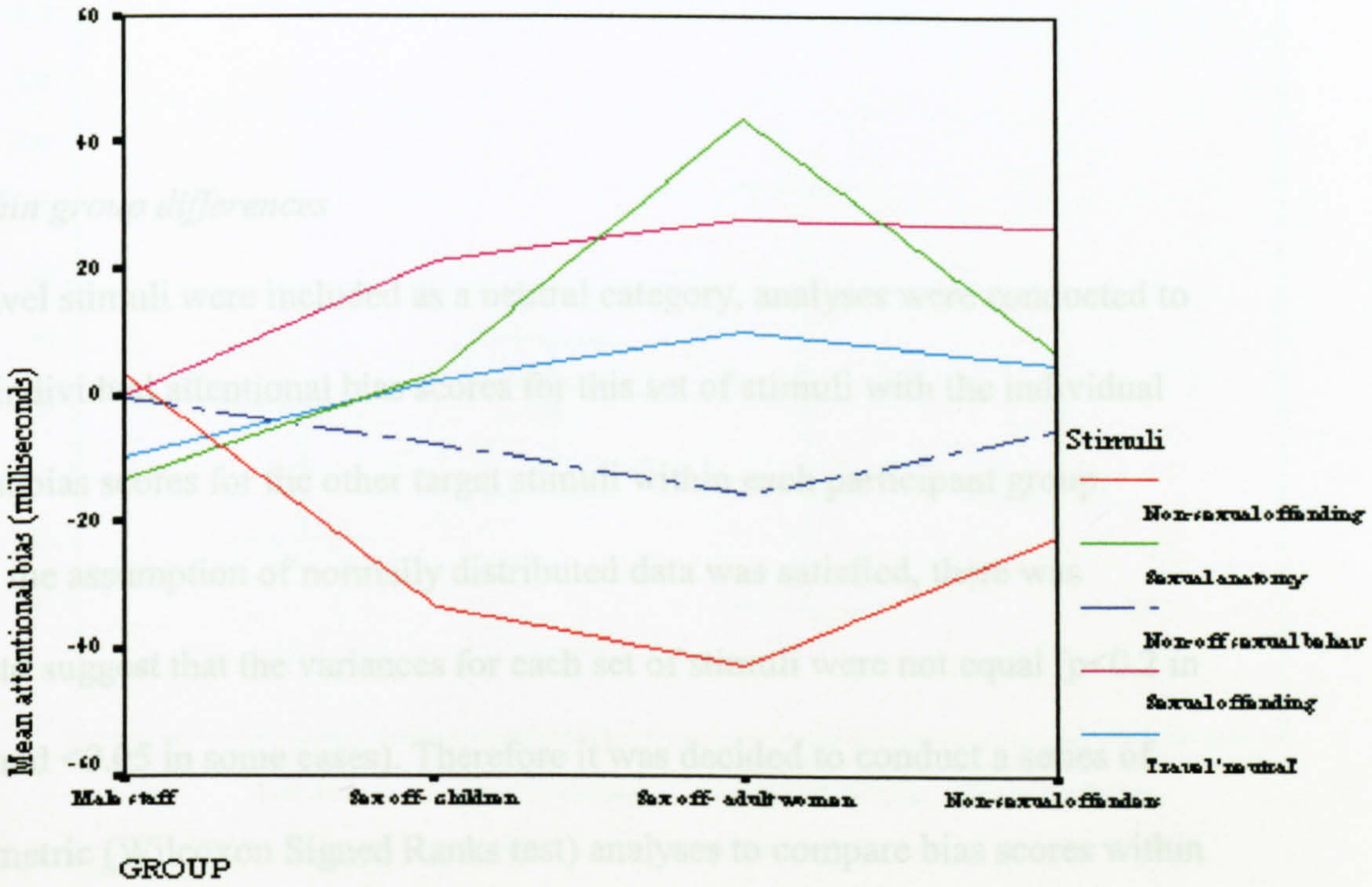
Mean attentional biases were calculated for each of the four groups of participants for each of the five sets of target stimuli. These are illustrated in Table 3.3, and graphically in Figure 3.1.

Table 3.3 Mean attentional biases for the five sets of target stimuli

	Male members of staff **Mean (SD)**	***Sexual offenders against children*** **Mean (SD)**	***Sexual offenders against adult women*** **Mean (SD)**	***Non-sexual offenders*** **Mean (SD)**
General offending words	**+3.32** (39.55)	**-33.4** (88.1)	**-42.64** (85.82)	**-22.11** (70.26)
Range	-48.6 - +77	-295.73 - +74.8	-220.6 – +71.62	-239.7 - +37.2
Sexual anatomy words	**-13.28** (67.68)	**+3.63** (67.98)	**+43.86** (58.66)	**+6.81** (63.8)
Range	-140.3 - +169.9	-101.1 - +101.1	-28.2 - +176.7	-129.5 - +128.07
Non-offending sexual behaviour words	**-0.44** (27.7)	**-7.68** (38.27)	**-15.6** (95.97)	**-5.34** (58.04)
Range	-48.6 – +55.1	-81.5 - +58.5	-183.35 - +190.92	-112.1 - +126.13
Sexual offending words	**+0.05** (45.76)	**+21.35** (53.99)	**+27.87** (144.5)	**+26.58** (67.19)
Range	-82.8 - +70.5	-72.2 – +106.2	-195.6 - +348.33	-63.38 - +179.6
Travel words	**-9.61** (45.18)	**+2.36** (39.09)	**+10.11** (59.4)	**+4.99** (97.12)
Range	-109.2 - +71	-60.55 - +96.6	-75.6 - +115.1	-146.1 - +296.5

SD= Standard Deviation. Bias scores are measured in milliseconds. Positive attentional bias values indicate speeded processing of the 'target' word. Negative bias scores indicate a bias away from the 'target' word. A bias score of zero suggests equally quick processing of 'target' word and 'neutral' word.

Figure 3.1 Graph illustrating the mean attentional bias scores for each of the four participant groups for each of the five sets of stimuli



3.3.1 Between group differences

Kolmogorov- Smirnov analyses revealed that the data for all the attentional bias scores for all four groups of participants were normally distributed ($p>0.3$ in all cases). The assumption of homogeneity of variance was satisfied for the 'general offending' and 'sexual anatomy' bias scores ($p>0.3$), but for the other three bias scores there was less strict confirmation of equal variances. Five sets of ANOVAs (for each target word) were however conducted[3] (with mean attentional bias score as the dependent variable and the four participant groups as the independent variables). No significant differences were found between the four participant groups in terms of

[3] It was decided that ANOVAs are robust enough to withstand the minor violations of the assumption of equality of variances that were observed.

their mean attentional bias scores for any set of stimuli. A non-parametric Kruskal Wallis analysis also failed to reveal significant differences between the groups.

3.3.2 Within group differences

As the travel stimuli were included as a neutral category, analyses were conducted to compare individual attentional bias scores for this set of stimuli with the individual attentional bias scores for the other target stimuli within each participant group. Although the assumption of normally distributed data was satisfied, there was evidence to suggest that the variances for each set of stimuli were not equal ($p<0.2$ in all cases and <0.05 in some cases). Therefore it was decided to conduct a series of non-parametric (Wilcoxon Signed Ranks test) analyses to compare bias scores within groups. No significant differences were found within any of the four participant groups between individual bias scores for travel stimuli and individual bias scores for the other four sets of 'target' stimuli.

3.4 Hypothesis Testing

3.4.1 Hypothesis One- Sexual offenders will show an attentional bias towards stimuli related to sexual offending.

Figure 3.2 illustrates graphically the mean attentional bias scores for each of the four participant groups for the sexual offending stimuli. 95% confidence intervals are included on the graph.

Figure 3.2 Mean attentional bias scores (in milliseconds, with 95% Confidence Intervals) for the four participant groups for stimuli related to sexual offending

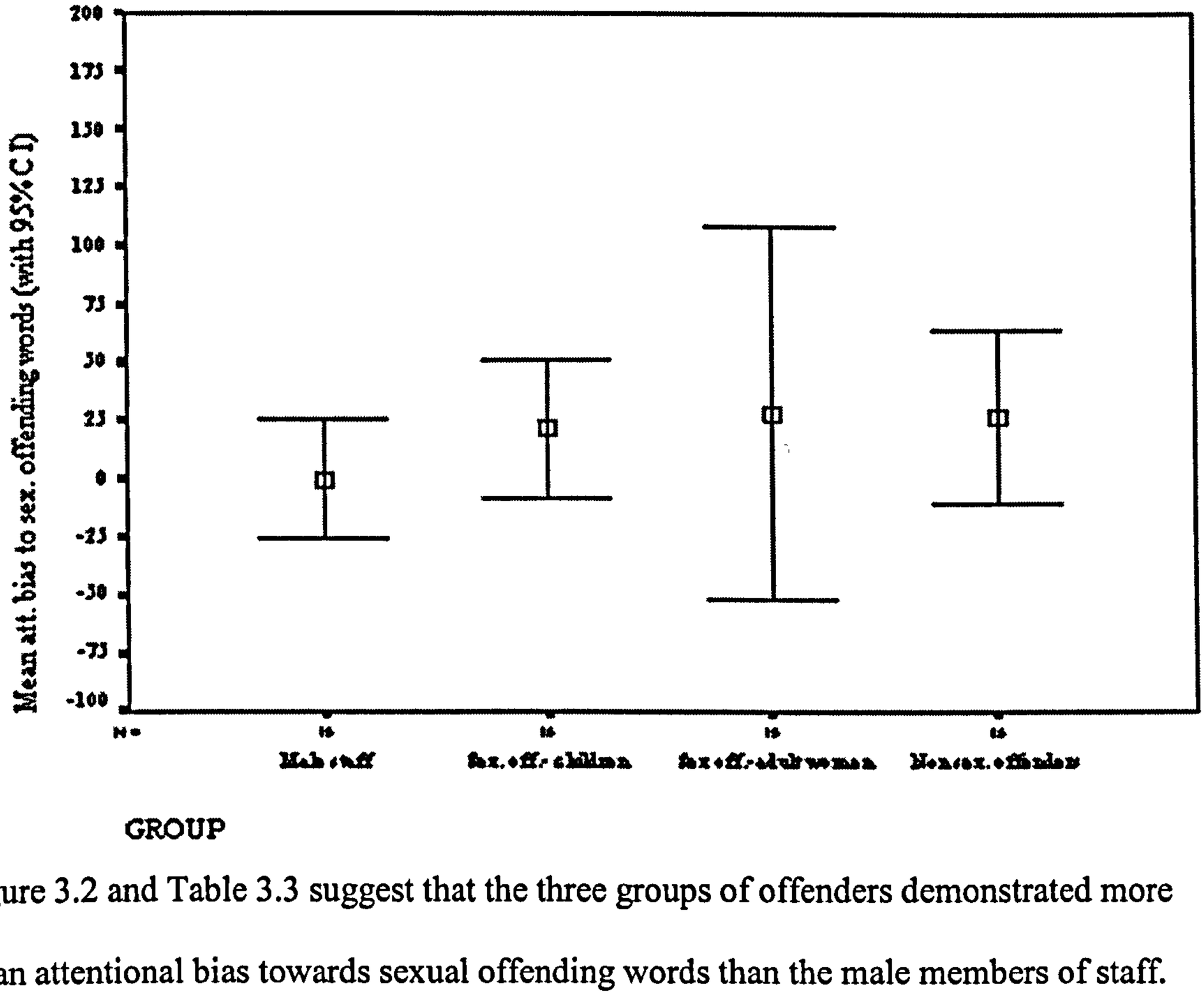


Figure 3.2 and Table 3.3 suggest that the three groups of offenders demonstrated more of an attentional bias towards sexual offending words than the male members of staff. One-sample t-tests were conducted to assess whether the positive mean attentional bias scores for each group of participants significantly differed from zero. A cautious significance level of $p<0.01$ was adopted to reduce the risk of a Type 1 error (rejecting the null hypothesis when it is true), as this is possible when a number of t-tests are used on a set of data. These results were not found to be significant for any of the individual groups. See Table 3.4 for test statistics.

Table 3.4 Summary test statistics of one-sample t-tests (bias scores for the stimuli related to sexual offending X the four participant groups)

Group	T	df	Sig (2-tailed)[4]	Mean difference
Male Staff	0.0004	14	0.997	0.0483
Sexual offenders against children	1.532	14	0.148	21.35
Sexual offenders against adult women	0.747	14	0.467	27.8689
Non-sexual offenders	1.532	14	0.148	26.5817

[4] The p values reported in the table can be halved as the hypothesis predicted a one-directional positive attentional bias. However the findings remain non-significant even when this is considered.

Therefore when the two groups of sexual offenders are considered independently there is no significant evidence to support hypothesis one that the sexual offenders against children and sexual offenders against adult women display an attentional bias towards sexual offending stimuli.

When the two groups of sexual offenders are considered as one group their mean attentional bias score becomes +24.61, with a standard deviation of 107.23. For this new group, the data was found to be normally distributed ($p>0.4$, Kolmogorov-Smirnov test). Confirmation of homogeneity of variance was not at a level that would have been desirable ($p>0.2$), but it was decided to proceed with parametric testing (refer to footnote 3). An ANOVA failed to show a significant difference between the new larger group of sexual offenders and the other two participant groups. A one-sample t-test (Table 3.5) revealed that the mean attentional bias towards sexual offending stimuli for the combined group of sexual offenders did not significantly differ from zero (again a cautious level of $p<0.01$ was adopted). This is further disconfirmation of hypothesis one. A non-parametric (Wilcoxon Signed Ranks Test) analysis also found that the combined group of sexual offenders' individual attentional bias scores for stimuli related to sexual offending did not differ significantly from their individual bias scores for the neutral 'travel' category.

Table 3.5 Summary test statistics of one-sample t-tests (bias scores for the stimuli related to sexual offending X the sexual offending/non-sexual offending groups)

Group	t	df	Sig (2-tailed)[5]	Mean difference
Male staff plus non-sexual offenders	1.256	29	0.219	13.315
Sexual offenders	1.257	29	0.219	24.6094

[5] The p values reported in the table can be halved as the hypothesis predicted a one-directional positive attentional bias. However the findings remain non-significant even when this is considered.

Table 3.3 and Figure 3.2 suggest that the offending groups of participants, particularly the group who had sexually offended against adult women, show more variation in their attentional bias scores for the sexual offending stimuli than the male members of staff. To further illustrate this, Figure 3.3.1 shows the attentional bias scores (for the stimuli related to sexual offending) for each individual participant who had committed sexual offences against adult women.

Figure 3.3.1 Individual attentional bias scores (in milliseconds, for stimuli related to sexual offending) for participants who had committed sexual offences against adult women

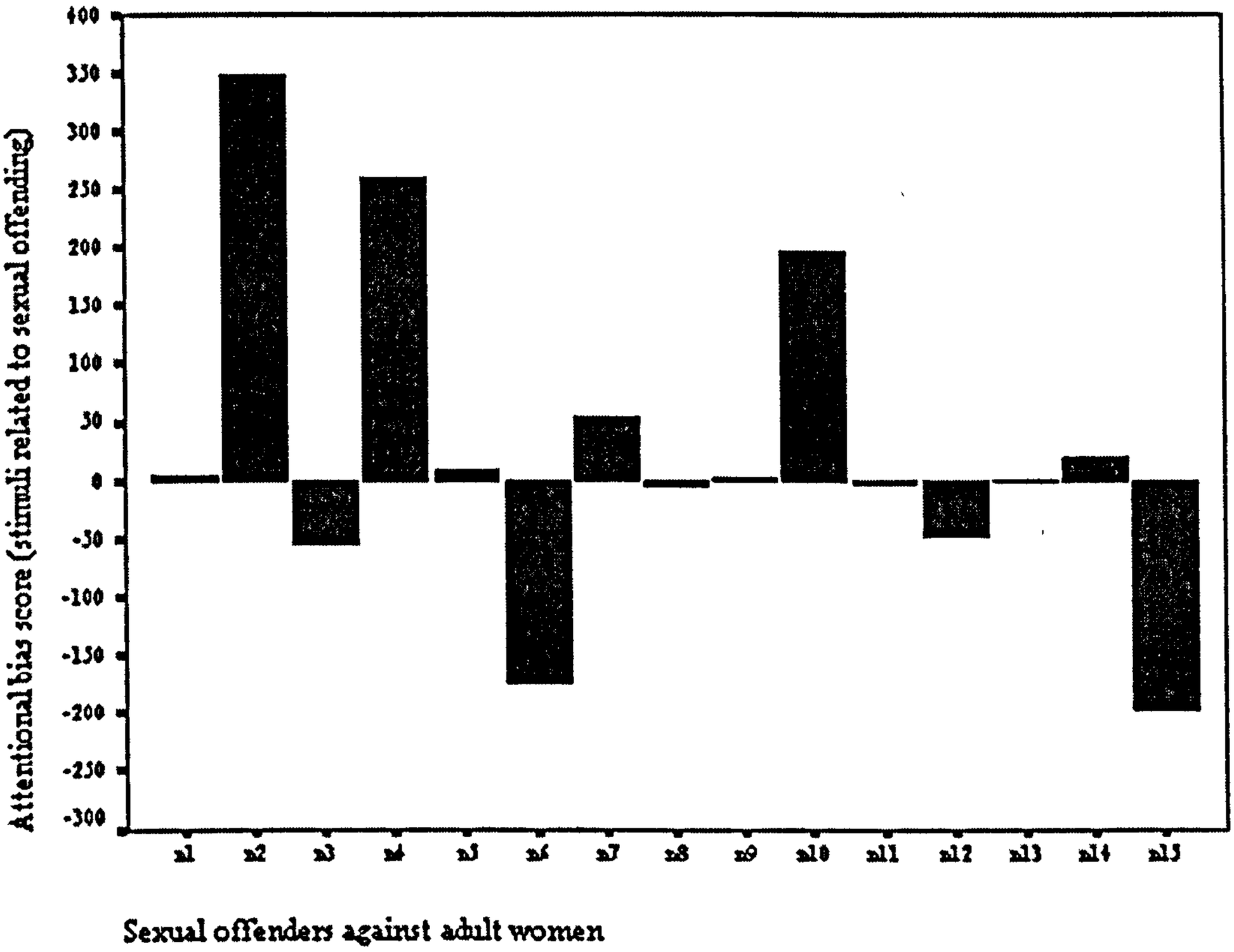


Figure 3.3.1 illustrates that some sexual offenders against adult women showed strong attentional biases towards the stimuli related to sexual offending (as indicated by their positive attentional bias scores). However two participants in particular showed strong biases away from the target stimuli. These would clearly have influenced the

subsequent mean attentional bias score for this group. Figure 3.3.1 also illustrates that around half (seven) of the sample of fifteen do not appear to show any kind of attentional bias, with their bias score falling between ± 10. Of the remaining eight, five of them showed rather extreme positive (>+150) or negative (>-150) bias scores. See Appendix Eleven for all individual participants' attentional bias scores.

Figure 3.3.2 shows the attentional bias scores (for the stimuli related to sexual offending) for each individual participant who had committed sexual offences against children.

Figure 3.3.2 Individual attentional bias scores (in milliseconds, for stimuli related to sexual offending) for participants who had committed sexual offences against children

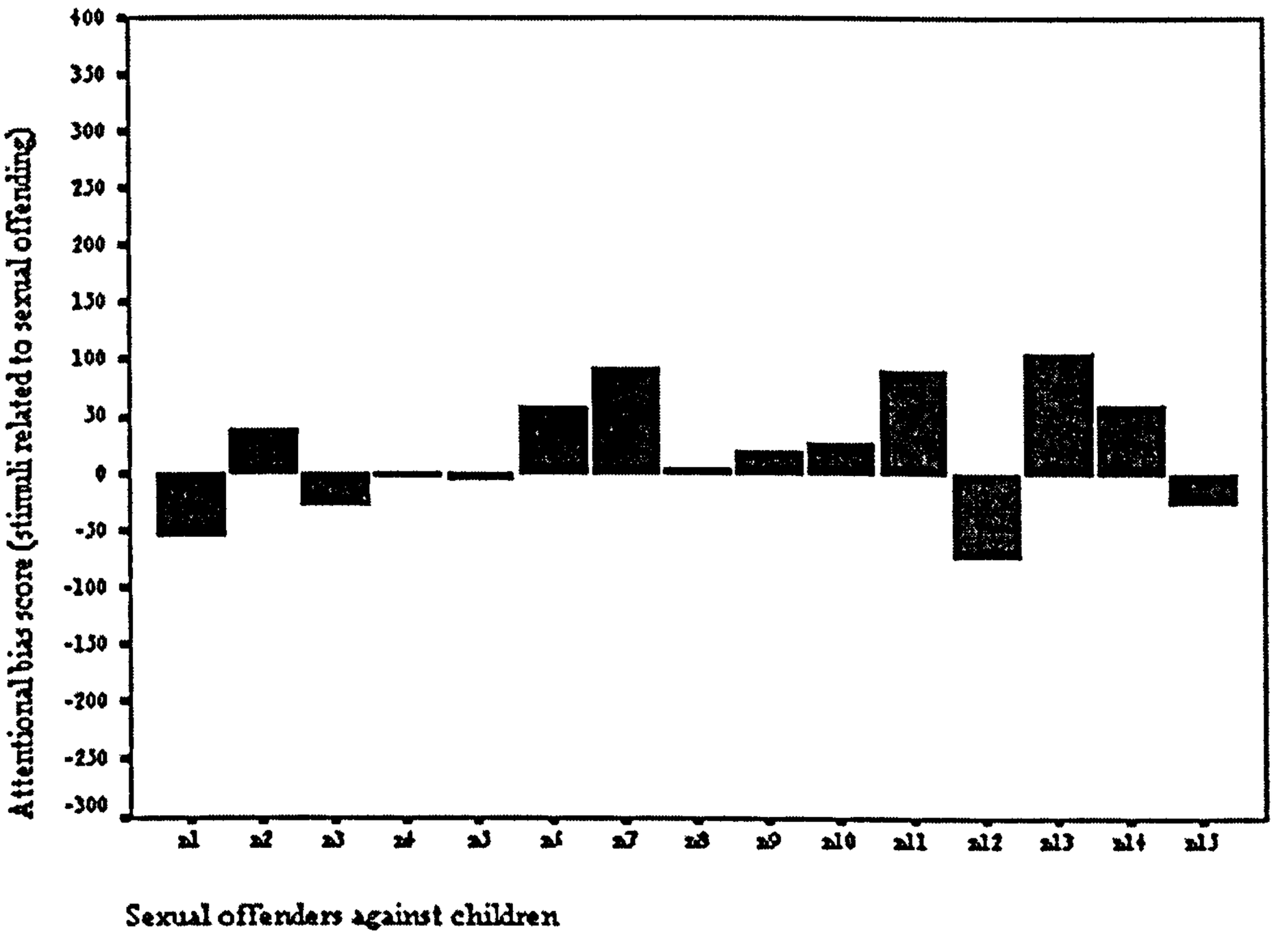
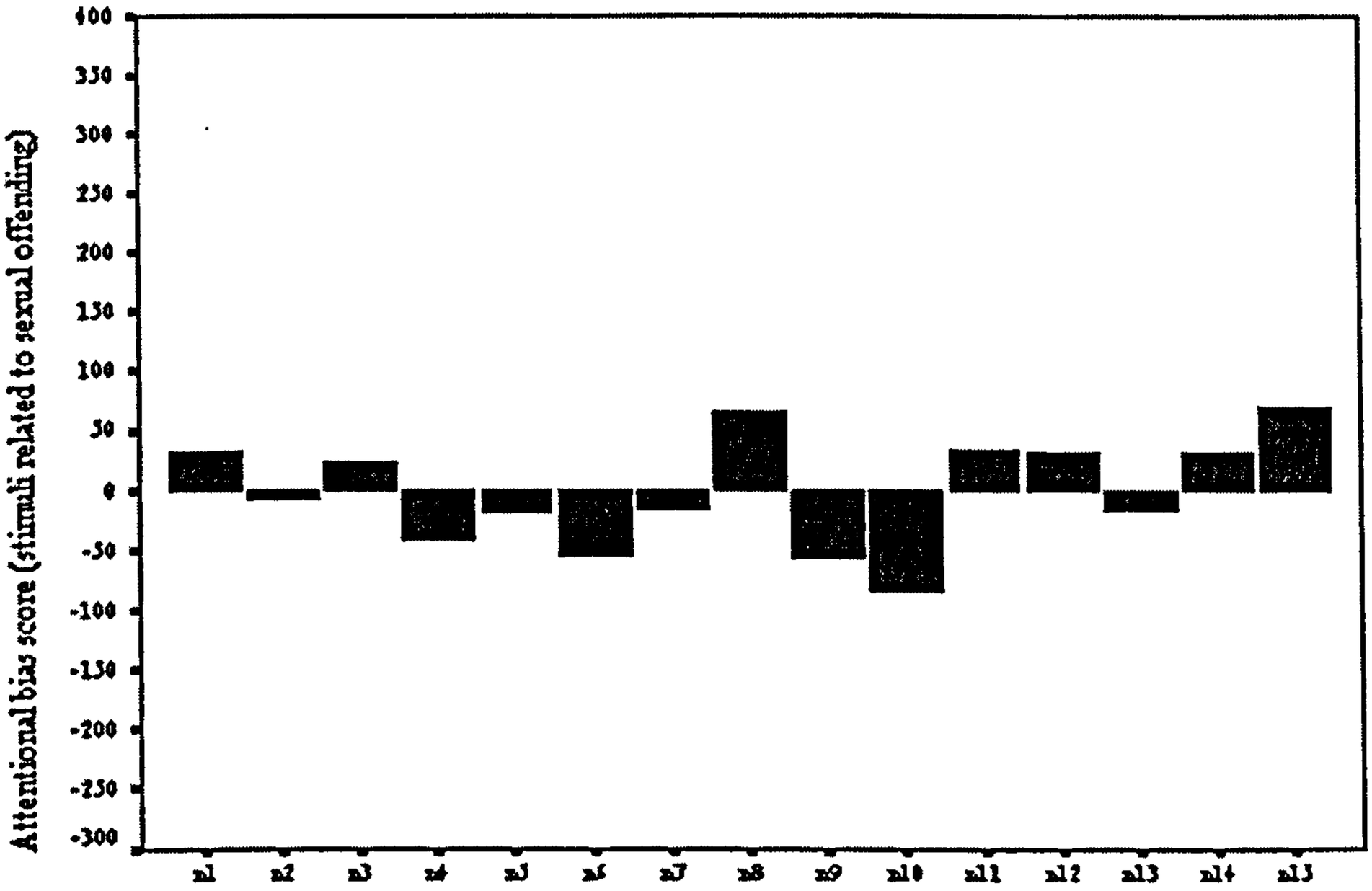


Figure 3.3.2 illustrates a narrower range of bias scores for the offenders against children than the sexual offenders against adult women. More than half (eight) of this sample of fifteen have a positive bias score between +19.9 and +106.2. Four have a negative bias score between –24.5 and –72.2. The remaining three fall between –5.05 and +4.97.

The 'male staff' group's individual range of bias scores for the sexual offending stimuli appear to be similar to the 'sexual offenders against children' group. See Figure 3.3.3.

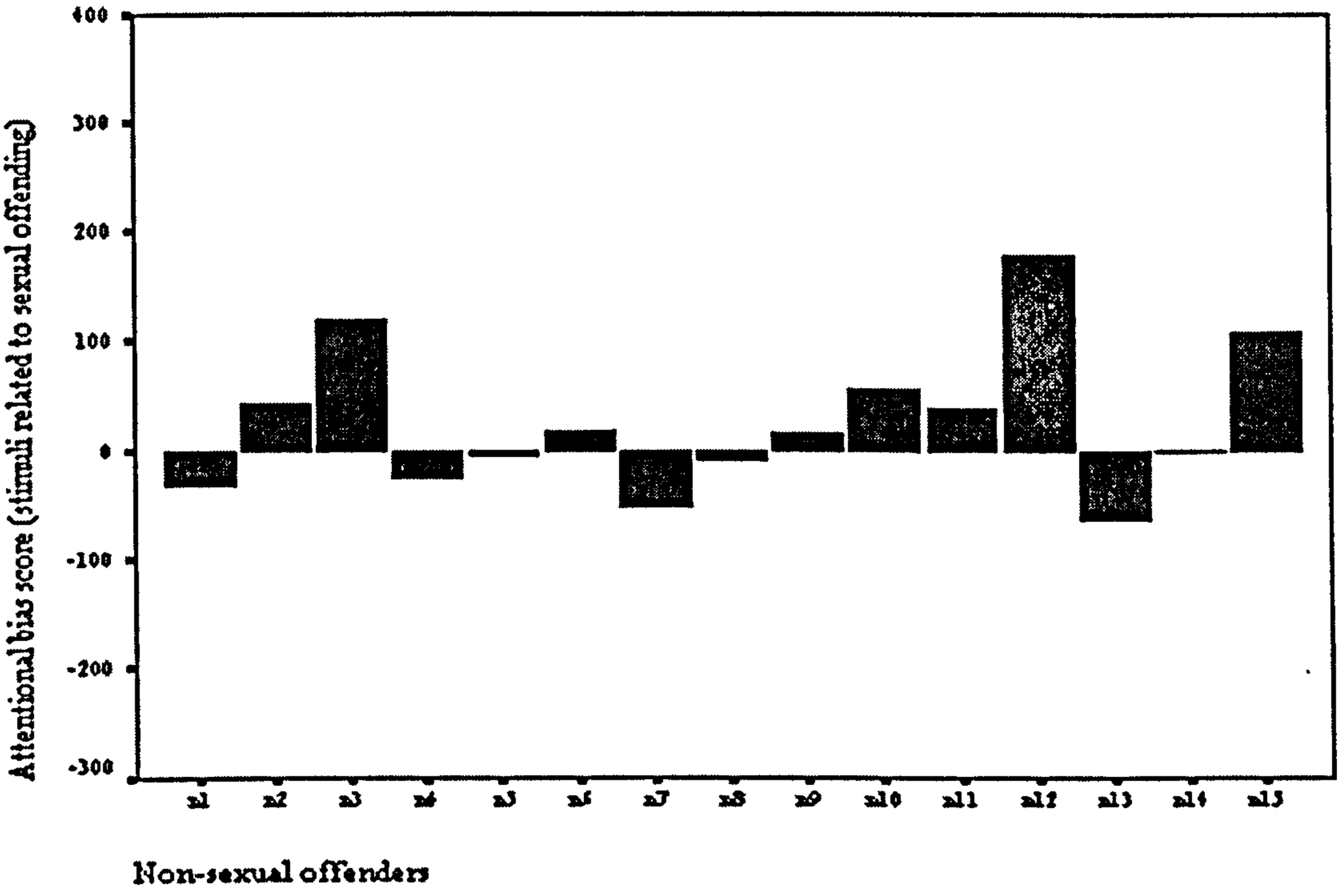
Figure 3.3.3 Individual attentional bias scores (in milliseconds, for stimuli related to sexual offending) for male members of staff



With the staff sample of fifteen, seven have noticeable positive biases (between +22 and +70.05) while seven have noticeable negative biases (between –14.5 and –82.8).

For the non-sexual offenders, Figure 3.3.4 shows that eight of the sample had a positive attentional bias score greater than +16. Three of those had a bias score greater than +100. Four had a negative bias score ranging between –24.8 and –63.38. The remaining three fell between –8.4 and +0.6.

Figure 3.3.4 Individual attentional bias scores (in milliseconds, for stimuli related to sexual offending) for non-sexual offenders



Given the individual variation within the three groups of offenders for the stimuli related to sexual offending, correlational analyses were conducted to explore any relationships between the offenders' attentional bias scores and the recorded written and demographic measures. These failed to reveal any significant relationship between the offenders' bias score for stimuli related to sexual offending and age, BDI score, length of stay in the hospital, Mill Hill score, State Anxiety or Trait Anxiety. When the whole sample of sixty participants were included in this analysis no significant relationship was found between attentional bias for sexual offending stimuli and any of the above measures.

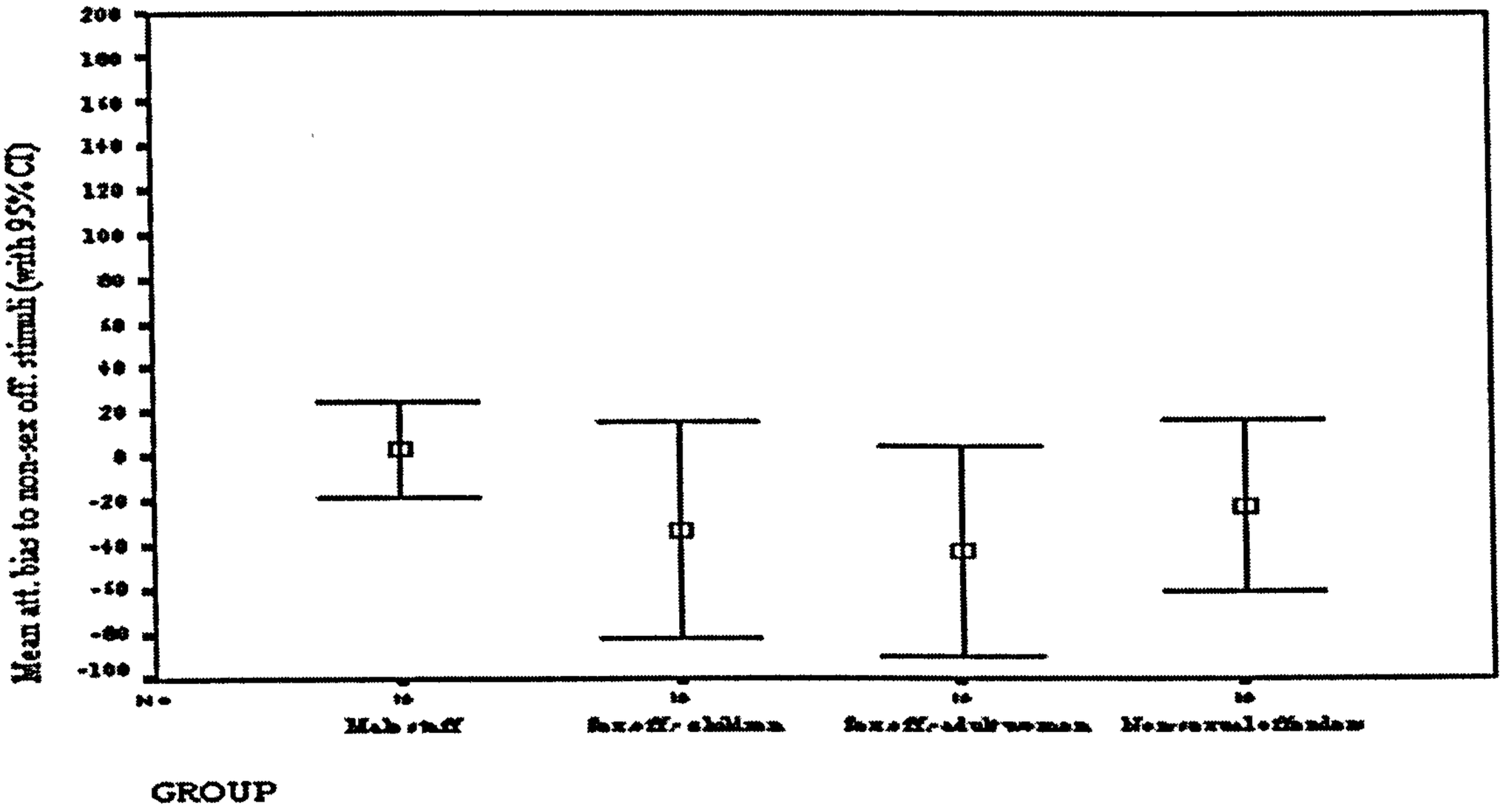
To summarize, there is no evidence to support hypothesis one that sexual offenders display an attentional bias towards stimuli related to sexual offending, and statistical analyses offer no reason to reject the first null hypothesis. There is also no evidence to

suggest that the sexual offenders' attentional bias scores towards sexual offending stimuli differ from their bias scores for the neutral category. However, examination of individual bias scores suggests considerable variation within groups, with some individuals showing extremely strong biases towards the stimuli and some showing extremely strong biases away from the stimuli. This is particularly noticeable in the group who had sexually offended against adult women.

3.4.2 Hypothesis Two- Offenders will show an attentional bias towards stimuli related to non-sexual offending

Figure 3.4 shows the mean attentional biases for the four groups of participants for the stimuli related to non-sexual offending. This illustrates that the mean bias scores for the three offending groups were negative, the opposite direction to that which was predicted. Therefore there was no support for hypothesis two.

Figure 3.4 Mean attentional bias scores (in milliseconds, with 95% Confidence Intervals) for the four participant groups for stimuli related to non-sexual offending



One-sample t-tests were conducted to establish whether the male staff or the three offending groups' negative mean bias scores differed from zero (again a cautious significance level of $p<0.01$ was adopted). Table 3.6 summarizes this information.

Table 3.6 Summary test statistics of one-sample t-tests (bias scores for the stimuli related to non-sexual offending X the four participant groups)

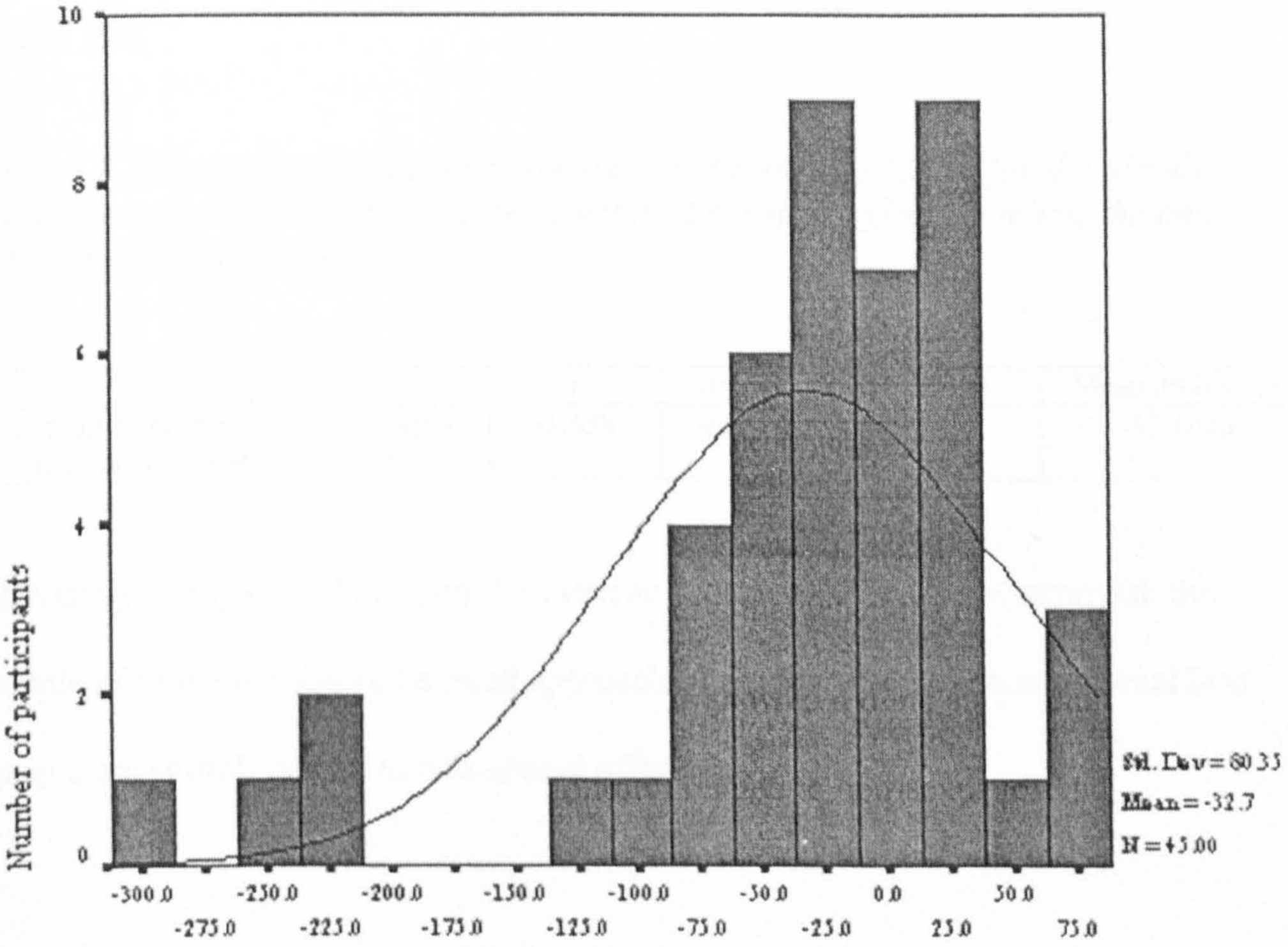
Group	T	df	Sig (2-tailed)[6]	Mean difference
Male staff	0.325	14	0.75	3.3150
Sexual offenders against children	-1.469	14	0.164	-33.4228
Sexual offenders against adult women	-1.924	14	0.075	-42.6383
Non-sexual offenders	-1.219	14	0.243	-22.1133

Table 3.6 confirms that when the three offending groups are considered separately there is no evidence of significant attentional biases away from the non-sexual offending stimuli.

[6] The remaining t-tests were 2-tailed as the bias scores were either not in the direction that was hypothesised, or no prediction was made as to the direction of bias scores.

If the offenders are considered as a combined group of forty-five their mean attentional bias score becomes –32.7, with a standard deviation of 80.35. A Kolmogorov-Smirnov analysis suggested weak evidence of normally distributed data ($p>0.1$), as did observation of a histogram showing the attentional bias scores for the forty-five offending participants (Figure 3.5). This illustrated that four participants appeared to be skewing the distribution in a negative direction. A non-parametric (Wilcoxon Signed Ranks Test) analysis showed that, for the combined group of offenders, their bias scores away from non-sexual offending stimuli significantly differed from their bias scores for the neutral 'travel' category ($z = -.958$, $p=0.05$).

Figure 3.5 Histogram illustrating the distribution of bias scores for stimuli related to non-sexual offending for the combined group of offenders



Despite the reservations regarding assumptions[7], a one-sample t-test was conducted; this suggested that the mean bias score for the non-sexual offending stimuli for the combined group significantly differed from zero (Table 3.7).

Table 3.7 Summary test statistics of one-sample t-test (bias scores for the stimuli related to non-sexual offending X the combined group of offenders)

Group	t	df	Sig (2-tailed)	Mean difference
Combined group of offenders	-2.732	44	0.009	-32.7248

After viewing the histogram in Figure 3.5, the one-sample t-test was re-conducted, having removed the four extreme negative 'outliers'. Kolomogorov-Smirnov analysis suggested that the bias scores for the remaining forty-one participants fitted a normal distribution ($p>0.9$). The one-sample t-test revealed that the mean bias for this sample (mean = -12.2, standard deviation = 46.13) did not significantly differ from zero (Table 3.8).

Table 3.8 Summary test statistics of one-sample t-test (bias scores for the stimuli related to non-sexual offending X the combined group of offenders minus the four extreme negative outliers)

Group	t	df	Sig (2-tailed)	Mean difference
Combined group of offenders minus four extreme negative outliers	-1.688	40	0.099	-12.1626

This analysis suggests that when the extreme negative outliers were removed, the sample of offenders showed a trend approaching significance, of an attentional bias away from stimuli related to non-sexual offending.

[7] There was weak evidence that the sample was normally distributed. However, t-tests are robust with respect to violations of the normality assumption (Simpson, 1995), so a parametric test was conducted.

The four 'outliers' were observed more closely but no unusual trends regarding their demographic background, scores on the self-report measures, or attentional bias scores for the other sets of stimuli were noticed.

Within the combined group of offenders it was decided to explore whether any of the demographic or written measures taken for this study were related to attentional bias for the stimuli related to non-sexual offending. A non-parametric Spearman's Rho correlation was therefore conducted; no significant relationships were found between attentional bias and BDI, Mill Hill, State Anxiety, Trait Anxiety, or length of stay in the hospital. There were also no significant relationships found when the whole sample of 60 participants was considered.[8]

To summarize, the three offender groups showed mean attentional biases away from stimuli related to non-sexual offending. This was the opposite direction to that which was predicted so hypothesis two was rejected. Statistical analysis suggested that it is not safe to reject the second null hypothesis. However, even when extreme negative bias scores were excluded, the combined group of offenders displayed a trend (approaching significance) towards an attentional bias away from stimuli related to non-sexual offending. There was also evidence that for this combined group of offenders, their negative bias score away from stimuli related to non-sexual offending significantly differed from their bias score for the 'neutral' travel category.

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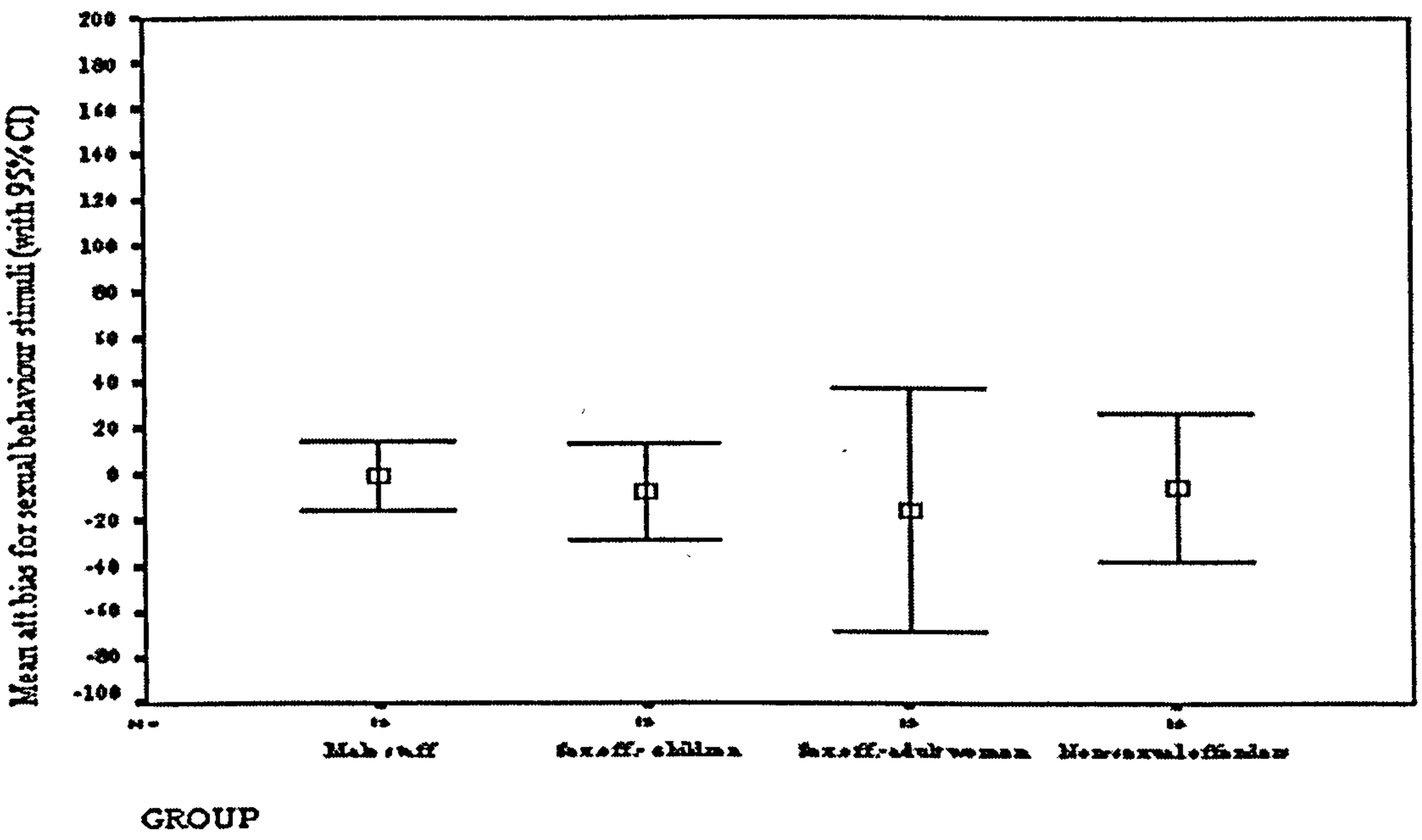
[8] When the whole sample of sixty was considered, a parametric correlational analysis suggested a significant relationship between attentional bias score for stimuli related to non-sexual offending and BDI score ($r=-0.265$, $p=0.041$). However, observation of histograms suggested that the bias data was skewed in a negative direction by four outliers. When these were removed, the parametric correlation became non-significant.

3.4.3 Hypothesis Three- Exploration of sexual offenders' attentional bias towards/away from stimuli related to non-offending sexual behaviour.

Table 3.3 and Figure 3.6 illustrates that all four groups of participants had a negative mean attentional bias for this set of stimuli.

Figure 3.6 Mean attentional bias scores (in milliseconds, with 95% Confidence Intervals) for the four participant groups for stimuli related to non-offending sexual behaviour



One-sample t-tests indicated that the mean bias scores for each group, and as a combined sample of sixty, did not differ significantly from zero (again a cautious significance level of $p<0.01$ was adopted) (Table 3.9).

Table 3.9 Summary test statistics of one-sample t-test (bias scores for the stimuli related to non-offending sexual behaviour X the four participant groups and combined participant group)

Group	T	df	Sig (2-tailed)	Mean difference
Male staff	-0.062	14	0.951	-0.4433
Sexual offenders against children	-0.777	14	0.45	-7.6783
Sexual offenders against adult women	-0.63	14	0.539	-15.6006
Non-sexual offenders	-0.356	14	0.727	-5.335
All participants	-0.945	59	0.348	-7.2643

When the two groups of sexual offenders were combined, their mean bias score became –11.64, with a standard deviation of 71.9. A one-sample t-test indicated that this combined bias score did not differ significantly from zero (Table 3.10). The combined sexual offenders' bias scores for the stimuli related to non-offending sexual behaviour were also not found to significantly differ from their bias scores for the 'neutral' travel category. (Wilcoxon Signed Ranks Test).

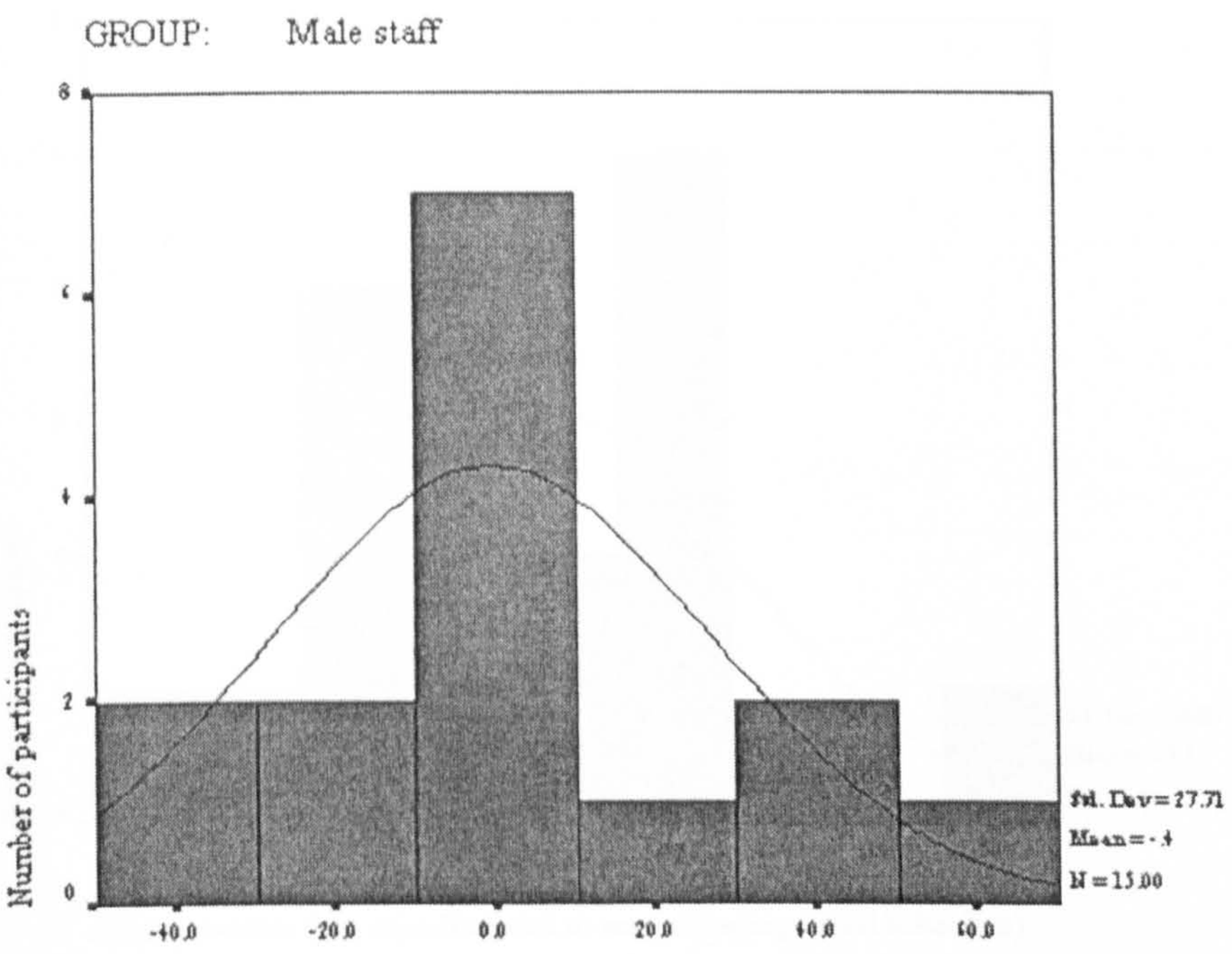
Table 3.10 Summary test statistic of one-sample t-test (bias score for the stimuli related to non-offending sexual behaviour X combined group of sexual offenders)

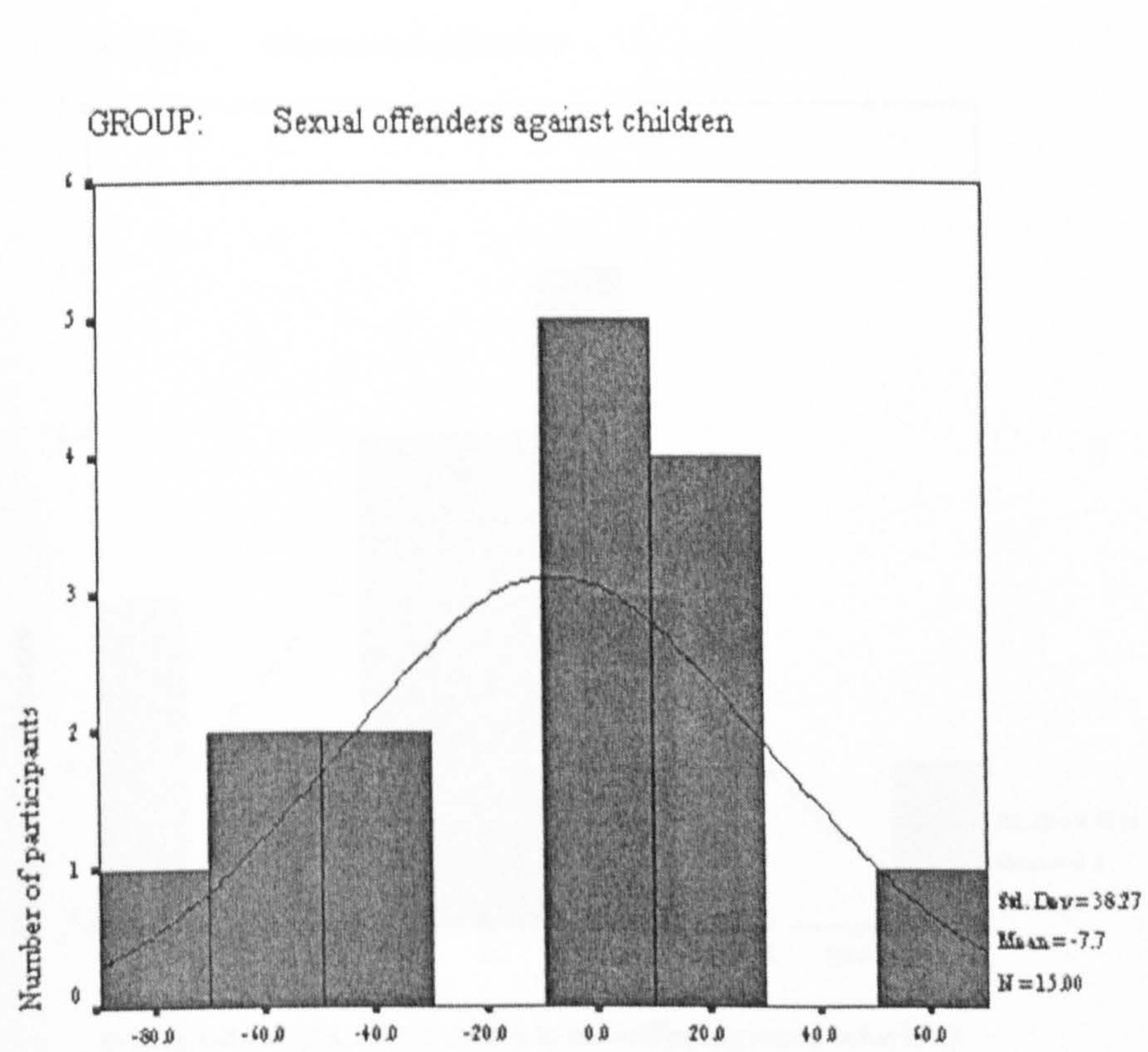
Group	T	df	Sig (2-tailed)	Mean difference
Sexual offenders	-0.887	29	0.383	-11.6394

Observation of histograms (Figure 3.7) suggested that all four participant groups had a similar distribution of scores for the stimuli related to non-offending sexual behaviour. The 'sexual offenders against adult women' group included relatively extreme values of –139.8, –183.35, and +190.92, while the 'non-sexual offender' group included the relatively extreme values of –90, -112.1, and +126.13. The range of bias scores were narrower for the 'sexual offender against children' group (-81.5 - +58.5) and the 'male staff' group (-48.6 - +55.1).

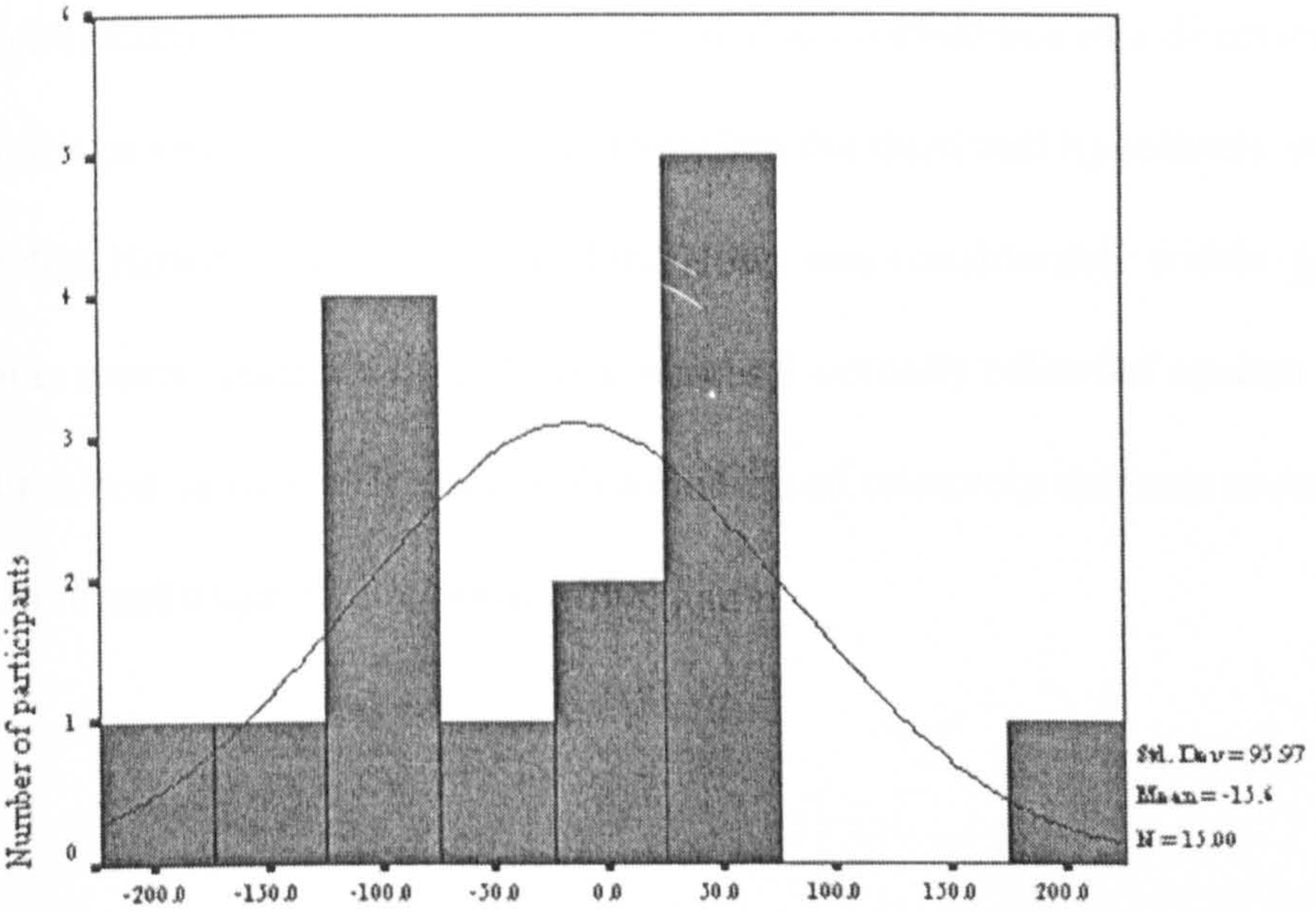
When all participants were considered as one sample, non-parametric correlational analyses suggested no significant relationship between bias score for stimuli related to non-offending sexual behaviour and the following measures: BDI, age, length of stay, State Anxiety, Trait Anxiety, Mill Hill, or attentional bias for any of the other sets of stimuli.

Figure 3.7 Individual histograms for the four participant groups' attentional bias scores for the stimuli related to non-offending sexual behaviour



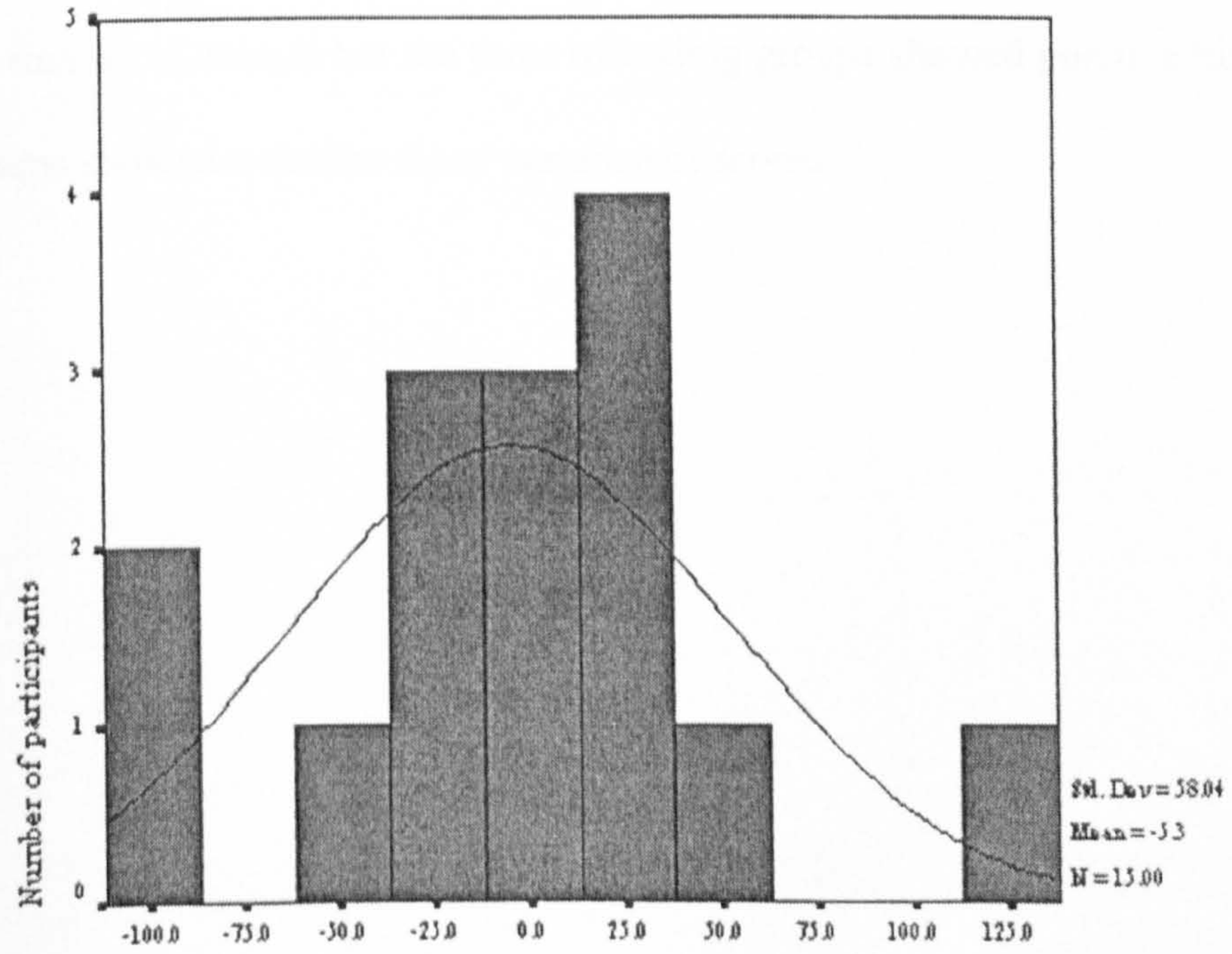


GROUP: Sexual offenders against adult women



Attentional bias (ms, stimuli related to non-offending sexual behaviour)

GROUP: Non-sexual offenders



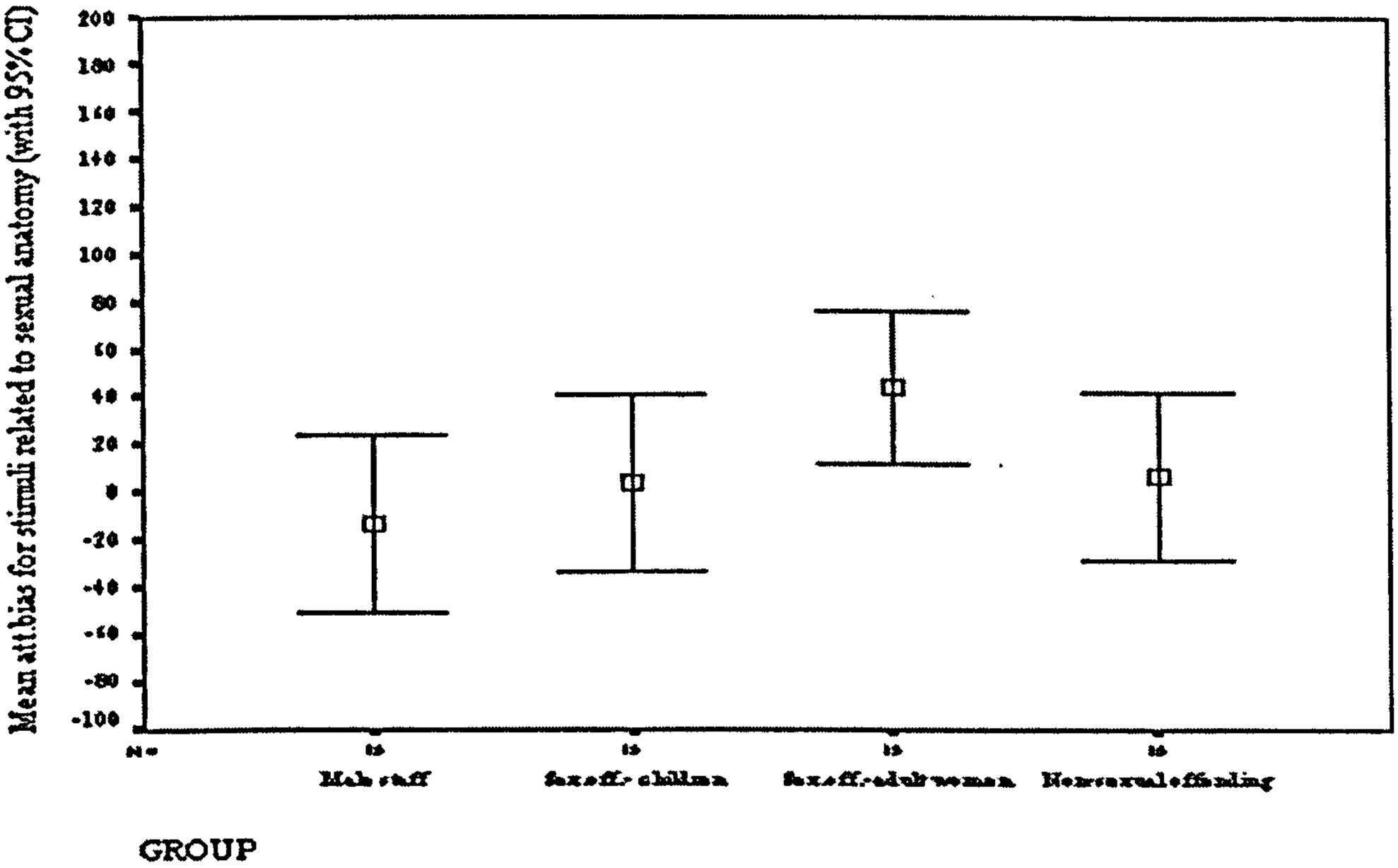
Attentional bias (ms, stimuli related to non-offending sexual behaviour)

To summarize there is no evidence to suggest that sexual offenders differ from non-sexual offenders and male staff in their attentional bias scores for stimuli related to non-offending sexual behaviour. There is also no evidence of a directional bias towards or away from the stimuli. Therefore the third null hypothesis was not rejected. However it was observed that there was considerable within-group variation in bias scores, particularly for those who had sexually offended against adult women, and the non-sexual offenders, with a number of relatively extreme scores in both a positive and negative direction witnessed.

3.4.4 Hypothesis Four- Exploration of sexual offenders' attentional bias towards/away from stimuli related to sexual anatomy

Table 3.3 and Figure 3.8 illustrates that the male staff had a negative mean bias score for this set of stimuli but the three offending groups showed positive bias scores. All groups showed a similar sized variance of scores.

Figure 3.8 Mean attentional bias scores (in milliseconds, with 95% Confidence Intervals) for the four participant groups for stimuli related to sexual anatomy



Inspection of the male staff group's individual bias scores (Figure 3.9.1) showed that five ($^1/_3$) of this sample had a positive bias towards stimuli related to sexual anatomy, with one relatively extreme score of +169.9. Of the ten participants with negative bias scores, two were more extreme than –50.

Figure 3.9 Individual attentional bias scores (in milliseconds, for stimuli related to sexual anatomy) for each participant within the four groups

Figure 3.9.1 Male staff

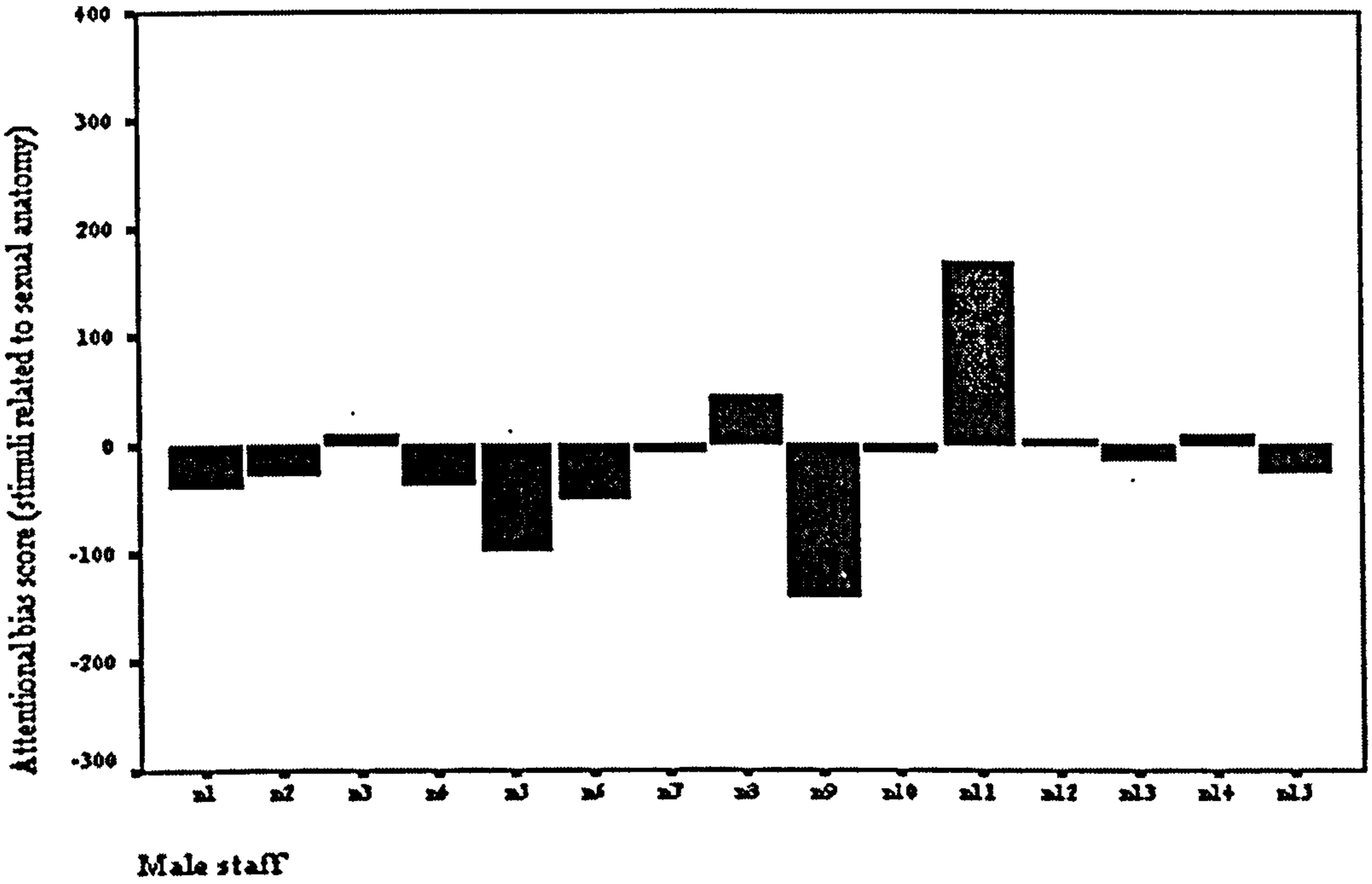


Figure 3.9.2 Sexual offenders against children

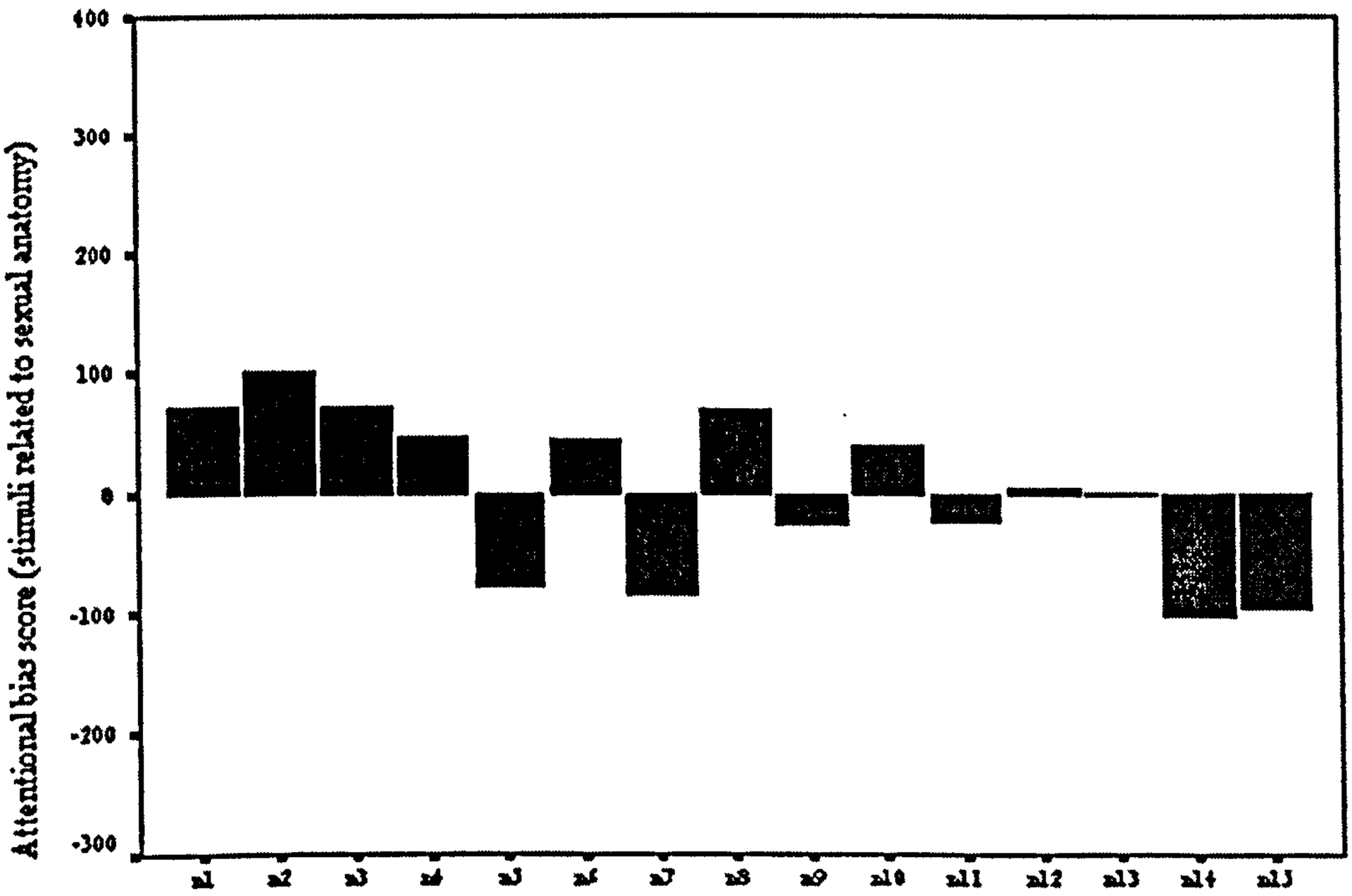


Figure 3.9.2 shows that for the 'sexual offenders against children' group, the most extreme bias scores were +101.1 and –101.1. Nine participants showed positive bias scores with six displaying negative scores for the stimuli related to sexual anatomy.

Figure 3.9.3 Sexual offenders against adult women

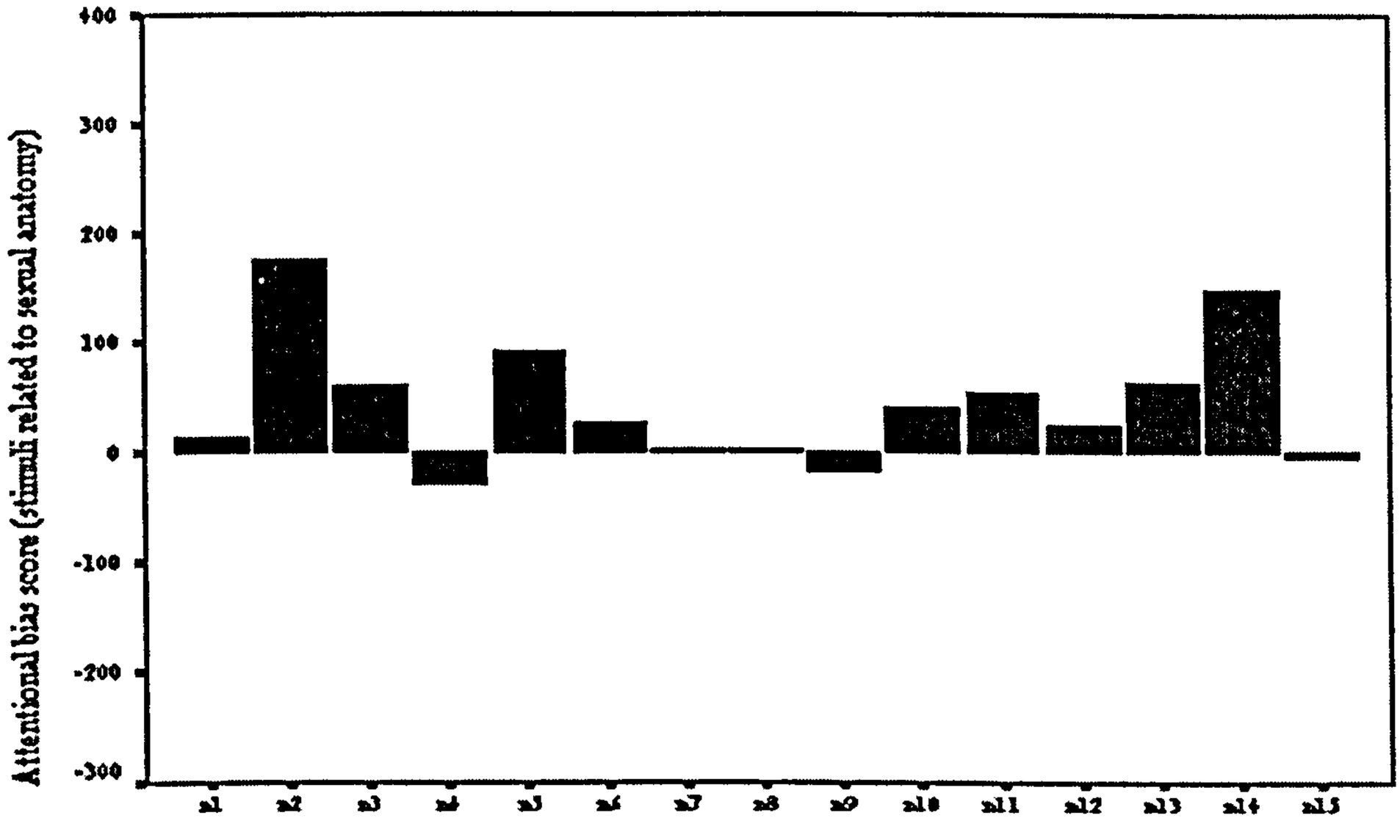


Figure 3.9.3 illustrates that twelve (80%) sexual offenders against adult women showed a positive bias score, with six displaying a bias greater than +50. The most negative bias score was –28.2.

Figure 3.9.4 Non-sexual offenders

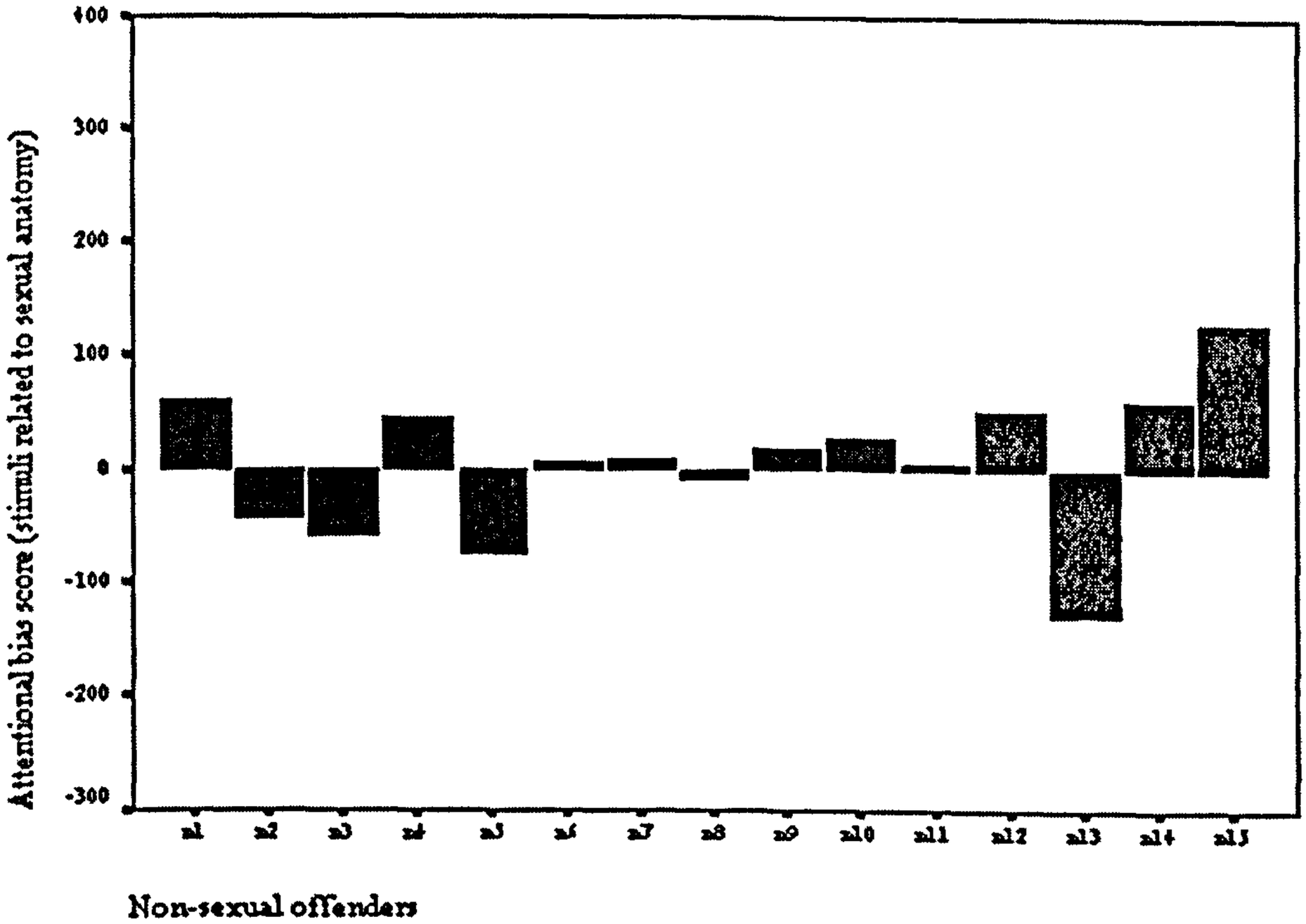


Figure 3.9.4 showed that ten ($^2/_3$) non-sexual offenders showed a positive bias with four scoring greater than +50. Of the five negative scores, three were more negative than –50.

One-sample t-tests showed that the positive mean bias score for the 'sexual offenders against women' group differed from zero. The difference only approached significance when a cautious level of $p<0.01$ was adopted (Table 3.11). This provides tentative evidence that sexual offenders against adult women show an attentional bias towards stimuli related to sexual anatomy.

Table 3.11 Summary test statistics of one-sample t-test (bias scores for the stimuli related to sexual anatomy X the four participant groups)

Group	T	df	Sig (2-tailed)	Mean difference
Male staff	-0.760	14	0.46	-13.2767
Sexual offenders against children	0.207	14	0.839	3.625
Sexual offenders against adult women	2.895	14	0.012	43.8561
Non-sexual offenders	0.414	14	0.685	6.8139

However, correlational analysis revealed that the individual 'sexual offenders against adult women's attentional bias score for stimuli related to sexual anatomy was significantly positively associated with their BDI score ($r=0.686$, $p<0.01$). Their bias score was not associated with any other recorded measure. It is therefore possible that the finding that sexual offenders against adult women show an attentional bias towards stimuli related to sexual anatomy could be explained as being due to their levels of depression.

When the sexual offenders were combined, their mean bias score became +23.74, with a standard deviation of 65.66. A one-sample t-test (Table 3.12) indicated a trend, approaching significance, of sexual offenders being biased towards the sexual anatomy terms.

Table 3.12 Summary test statistics of one-sample t-test (bias scores for the stimuli related to sexual anatomy X the combined group of sexual offenders)

Group	t	df	Sig (2-tailed)	Mean difference
Sexual offenders	1.98	29	0.057	23.7406

For the combined group of sexual offenders, their positive bias score for stimuli related to sexual anatomy was not found to be associated with their BDI score.

In summary there is little evidence to suggest that sexual offenders differ from non-sexual offenders and male staff in their attentional bias scores for stimuli related to sexual anatomy. There is tentative evidence of sexual offenders against adult women showing an attentional bias towards stimuli related to sexual anatomy, but this bias score was associated with their level of depression, and this factor may explain this significant finding. When sexual offenders were considered as a combined group a

trend, approaching significance, of them displaying an attentional bias towards stimuli related to sexual anatomy was observed. Therefore the fourth null hypothesis is retained with caution. The range of bias scores observed within groups appeared to be similar for all groups. Again there was considerable variation within groups, although 80% of the sexual offenders against adult women recorded a positive bias. Of note, the second highest positive bias score and the most extreme negative score were found in the male staff group.

3.5 Bias scores regardless of direction

In testing the hypotheses and calculating mean attentional bias scores, the individual participant's bias score towards the target stimuli (positive attentional bias scores) or away from the target stimuli (negative attentional bias scores) were used. Table 3.3 suggests that the offending groups show a broader range of attentional biases (in both a positive and negative direction) than the male staff group, particularly for the sexual and non-sexual offending stimuli. It was therefore decided to compare mean bias scores (away from zero, regardless of the direction of the bias) for each group for each set of stimuli. These are illustrated in Table 3.13.

Table 3.13 Mean bias scores (in milliseconds, away from zero regardless of direction) for the four participant groups for the five sets of stimuli

	Male members of staff **Mean (SD)**	***Sexual offenders against children*** **Mean (SD)**	***Sexual offenders against adult women*** **Mean (SD)**	***Non-sexual offenders*** **Mean (SD)**
General offending words ***Range***	**28.6** (26.5) 1.7 – 77	**56.2** (74.69) 0.3 – 295.73	**67** (67.12) 4.7 – 220.6	**45.8** (56.73) 2 – 239.7
Sexual anatomy words ***Range***	**45.1** (50.87) 5.5 – 169.9	**57.2** (33.58) 1.03 – 101.1	**50.5** (52.6) 2.1 – 176.7	**48.5** (39.98) 3.75 – 129.5
Non-offending sexual behaviour words ***Range***	**20.6** (17.68) 0.72 – 55.1	**28.9** (25.17) 0.1 – 81.5	**77.4** (55.18) 0.5 – 190.92	**41.9** (38.93) 1.75 – 126.13
Sexual offending words ***Range***	**38.5** (22.52) 7.22 – 82.8	**45.8** (33.95) 2.4 – 106.2	**91.4** (112.92) 0 – 348.33	**51** (49.82) .6 – 179.6
Travel words ***Range***	**32.8** (31.43) 1.5 – 109.2	**27.2** (27.18) 0.7 – 96.6	**48.9** (32.87) 9.1 – 115.1	**61.8** (73.23) 7.38 – 296.5

SD= Standard Deviation.

Kolmogorov-Smirnov analyses showed that there was not strong evidence to support the assumption of normal distributions for all groups for all sets of stimuli ($p>0.3$ in most cases, but $p>0.1$ in some cases). The assumption of homogeneity of variance was also not satisfied for the 'non-offending sexual behaviour' and 'sexual offending' data ($p<0.05$). A series of non-parametric (Kruskal Wallis) analyses indicated no significant differences between the four participant groups in terms of their bias scores for any of the sets of stimuli.

Non-parametric (Wilcoxon Signed Ranks Test) analyses were conducted to compare within group bias scores for the four sets of 'target' stimuli with bias scores for the

'neutral' travel stimuli. The only significant difference found was within the 'sexual offenders against children' group, where bias scores for the sexual anatomy stimuli differed from the bias scores for the 'neutral' stimuli ($z= -2.783$, $p<0.01$). No significant within group differences were found when the offenders were considered as a combined group, or when the sexual offenders were considered as a combined group.

SECTION FOUR

DISCUSSION

4.1 Summary of Results

Hypothesis 1) There was no statistical evidence to support the hypothesis that sexual offenders as a group show attentional biases towards stimuli related to sexual offending, but all three groups of offenders did display more of a bias in the hypothesised direction than the male members of staff. As individual groups, the three sets of offenders showed more of a positive bias towards the sexual offending stimuli than they did to the neutral 'travel' stimuli but these observed differences were also not proved to be significant. There were considerable differences between the bias scores of individual participants within groups (particularly for 'sexual offenders against women' and 'non-sexual offenders'), with some showing extreme attentional biases towards the sexual offending stimuli and some showing extreme biases away from the stimuli.

Hypothesis 2) There was no evidence to suggest that offenders show an attentional bias towards stimuli related to non-sexual offending. Indeed the pattern of bias scores suggested an opposite trend, with the finding (approaching significance) that offenders in general (as a combined group) showed an attentional bias away from stimuli related to non-sexual offending. The bias scores for this combined group of offenders away from the offending stimuli also significantly differed from their bias scores for the neutral 'travel' category.

Hypothesis 3) There was no evidence that sexual offenders (as a combined group) showed an attentional bias towards or away from stimuli related to non-offending

sexual behaviour, and no evidence that their bias scores for this set of stimuli differed from their bias score for the neutral 'travel' category. There was also no evidence that sexual offenders differed from non-sexual offenders and male controls in their response to this set of stimuli. All four groups of participants (when considered as individual groups and as a combined sample) showed non-significant bias scores away from the stimuli related to sexual behaviour. However, considerable within-group variation in bias scores were observed, particularly in the 'sexual offenders against adult women' and 'non-sexual offenders' groups, with a number of relatively extreme scores in both a positive and negative direction seen.

Hypothesis 4) For the sexual anatomy stimuli, the male staff showed a non-significant bias away from the stimuli, but considerable individual variation in bias scores were observed. All three groups of offenders' mean bias scores were seen to be in the positive direction i.e. towards the stimuli. When the two groups of sexual offenders were combined, a trend, approaching significance, was observed, for them to be biased towards the sexual anatomy words. However this combined group's bias score for sexual anatomy stimuli was not found to differ from their bias score for the neutral 'travel' stimuli.

When bias scores regardless of direction were considered, there was generally no evidence that the sets of 'target' stimuli had more effect on the participants' attention than the neutral 'travel' stimuli.

4.2 Interpretation of findings

For each hypothesis the findings will be interpreted and reflected upon, taking into account methodological considerations. Ideas for future research and clinical implications are also discussed.

4.3 Hypothesis One

This first examination of attentional processes in sexual offenders does not offer strong confirmation of the existence of a bias towards stimuli related to sexual offending. The predictions from the cognitive model of sexual offending that sexual offenders are vigilant towards stimuli salient to their schema content in a similar way to that which has been demonstrated for individuals with emotional disorders, have not been supported. There are obvious differences between applying a model and information processing approach that has been applied and developed primarily with emotionally disordered individuals to a sexually offending population, but the rationale for doing so seemed clear. Marshall et. al. (2000) stated, for example, that the cognitive model proposes that it is the content of sexual offenders' distortions that differ from the 'normal' population and not the distorting processes.

There were certain noticeable patterns within the data (in the direction that was predicted) that are interesting to consider more closely, but these must be explored carefully given that no differences were found to be significant. The three offending groups did show more of a bias towards the sexual offending stimuli than male controls but the distinct variation within groups made it difficult to establish significance. For the sexual offenders against women in particular, extremely positive and negative bias scores were observed, suggesting that for some sexual offenders,

stimuli related to sexual offending may indeed capture attentional resources, as the cognitive model of sexual offending would predict (Marshall et. al., 2000). That some offenders' attention was biased away from the sexual offending stimuli is also important to consider. A possible explanation for this is discussed later.

Although offenders against children appeared to show a similar range of bias scores as the male controls, their overall mean tended towards more of a positive attentional bias. This relatively greater bias towards the sexual offending stimuli offers a tentative suggestion that the stimuli used may be more salient for the child sexual offenders than for the male controls.

The finding that sexual and non-sexual offenders displayed a similar non-significant mean bias score towards the stimuli related to sexual offending is difficult to interpret. Although some studies have found it difficult to distinguish sexual and non-sexual offenders on the basis of their cognitive distortions regarding sexuality and rape myth acceptance (e.g. Overholser and Beck, 1996), it was not predicted here that words related to sexual offending would be salient enough for the non-sexual offenders to show a bias in that direction. One possibility for this difficulty in distinguishing between sexual and non-sexual offenders could be that they have certain things in common that are different to the male control group. For example, they may have had similar life experiences, upbringing, values and educational backgrounds.

4.3.1 Hypothesis One Methodological Reflections

4.3.1.1 Heterogeneity of groups

The considerable individual differences observed in bias scores suggests that a 'group comparison approach' may not be the best way to explore attentional bias within a sexually offending population. Two groups of sexual offenders, i.e. those who had committed offences against children, and those who had committed offences against adult women were compared in the current study. There was some overlap between groups as some of the 'child offenders' had also committed sexual offences against women. However it was established, as far as was possible, that the offenders against adult women had not offended sexually against children. This 'simplistic' categorisation of offenders does not account for the individual differences observed clinically between sexual offenders. Indeed, researchers in this area have found it difficult to attach labels to distinctive types of offender. Patterns and profiles of offending differ as do the individual's motivation for offending. It may be interesting to narrow attentional bias comparisons down to specific 'sub-types' of sexual offender (or even specific types of offending behaviour) in future research.

Previous research and clinical observation has found that child sexual offenders and offenders against adult women generally demonstrate different types of cognitive distortion (for example, offenders against children have been shown to hold beliefs that legitimise sexual involvement with children, while offenders against adult women have been found to accept rape myths. The rationale for hypothesising the existence of biased attentional processes in sexual offenders in the current study was based on the notion of them having distorted cognitions. However, one drawback of the design of the current study was that it did not incorporate any measures of cognitive

distortion. It would have been interesting to investigate the relationship between 'degree of distortions' and 'degree of attentional bias'. This is a definite limitation of the current methodology but it was beyond the constraints of time, resources, and the willingness of the institution to allow this data to be collected in the context of the current study, that current measures of participants' cognitive distortions could be incorporated into the analysis. There is also no accurate, quick to administer, closed to social desirability bias, self-report measure of cognitive distortion that could have been used. Behavioural observation and clinical judgement (often more reliable measures of cognitive distortion) would clearly not have been practical 'measures' in the current study.

Some offenders will have received assessments of their cognitive distortions regarding offending as part of a comprehensive examination of their offending behaviour during their stay in the high security hospital. These had all taken place at differing time points and thus these previous measures could not be used as reliable accounts of current levels of cognitive distortion; A number of factors can lead to changes in distortions over time, including rehabilitation/treatment, so it was not felt to be appropriate to use this data in the current study. Also, data was not available for all participants.

A range of therapeutic interventions (including individual therapy and structured group work) is offered within the high security hospital, the most common theoretical approach being cognitive therapy. Cognitive therapy aims to change underlying cognitions (Beck, Rush, Shaw and Emery, 1979), and it has been found that group work often helps offenders gain insight into their own offences, through identifying

with the victims of other offenders' offences (Quayle, 1989). Therefore it could be expected (or certainly hoped) that the cognitive distortions of sexual offenders will have been reduced following therapy. Previous research with anxiety disorders has indicated that attentional biases no longer exist following cognitively oriented therapy that has aimed to address dysfunctional thinking and beliefs (Mogg et. al., 1992; Mathews, Mogg, Kentish, and Eysenck, 1995). A limitation of the current study was that it took no account of the type or outcome of therapies that participants had been engaged in. Merely by living within a 'therapeutic' environment, one could expect distortions to be challenged by other patients and staff over time. One way of overcoming these potential confounding factors in future research would be to assess cognitive distortions soon after an individual's admission, through established methods (often interview or questionnaire, with the aforementioned limitations noted), and to examine attentional bias before and after a routine cognitive intervention. Such a study would need to be more longitudinal in design and would require access to a larger population of sexual offenders (through a number of different institutions, as new admissions of sexual offenders to the current study's high security hospital do not occur on a regular basis.

The methodology also does not take into account that some offenders may themselves have been victims of sexual offences. Jehu (1991) reported that between 23 and 57% of convicted sex offenders have themselves been sexually abused during childhood. Previous research with rape victims with post-traumatic stress disorder (Foa et. al., 1991) found that 'rape' words produced interference on the STROOP task. It is possible that victims of sexual crimes might have shown an attentional bias towards stimuli related to sexual offending because they had been a victim of sexual offences.

Future research with a similar participant group should ideally include a measure of 'victim experiences' within the data collection and analysis.

4.3.1.2 Selection of stimuli

As this was the first time the dot probe methodology had been applied to an offending population, the words to be used as 'target' stimuli had to be produced by the researcher. Given this, the possibility existed that they may not have had the desired saliency for the participant groups.

The original plan was to develop sets of stimuli specific to sexual offending against children and adult women, as past research (e.g. Segal and Stermac, 1990) had indicated that these different groups of offenders have cognitive distortions of differing content. However despite considerable attempts to achieve this, through consulting literature, and discussions with experienced clinicians, it was not possible to produce enough terms that would have been distinctly salient to the content of the cognitive distortions of sexual offenders against children or adult women.

The researcher had decided on a minimum of twenty words per category of stimuli. This allowed five words in each category to appear in each of the four combinations (outlined in the Method section) within the dot probe task. As it was not possible to achieve this, a decision was made to produce a set of sexual offending terms that were more general and no longer specific to the content of either set of sexual offenders' cognitive distortions. The result of this was that some of the terms in the 'general sexual offending' category would not have been salient to either sexual offenders

against children or sexual offenders against adult women; this may explain the non-significant findings with the two sexual offending groups.

By conducting the task with more general sexual offending stimuli, the experimental paradigm has essentially moved away from testing attentional bias specific to the content of the cognitive distortions of sexual offenders to an approach that assessed whether sexual offenders show an attentional bias towards more general sexual offending stimuli. Cognitive distortions have been defined as 'self statements that allow offenders to deny, minimize, justify and rationalize their behaviour' (Murphy, 1990). Examples of key terms that would logically have seemed to be salient to the distortions of sexual offenders against adult women might include 'tease', 'tart', 'whore', 'slut', 'nympho' etc. However, even if a more specific set of terms had been produced based on the specific cognitive distortions of sexual offenders against adult women or children, there remains the possibility that in order for an attentional bias to be observed, the terms would need to have been specifically salient to each individual's set of beliefs or assumptions associated with their own specific pattern of offending. This strengthens the appeal for future comparisons to be narrowed down to offenders with a history of specific types of sexual offending.

The terms that were identified were piloted on psychologists to gain a consensus that they fit into distinct categories. One possibility is that individuals in the offending groups may not have categorised the terms in a similar way. Although a measure of verbal IQ was administered, and no between group differences were found, it is also possible that some participants may not have been able to read some of the terms presented in the experiment. A way of ruling out both of these possibilities would

have been to ask participants to read and define the list of words used in the experiment after they had completed the probe detection task. This was considered in the current study but not implemented in order to keep the length of task to a level that remained tolerable for participants.

4.4 Hypothesis Two

The finding that the combined group of offenders displayed a trend approaching significance away from the stimuli related to non-sexual offending is interesting. That this bias was found to be significantly different to that for the 'neutral' travel category suggests that it cannot be explained as being due to the non-sexual offending terms also fitting into a distinct category.

However, the observed bias was in the opposite direction to that which was predicted, suggesting that although the offenders did not demonstrate increased vigilance towards this set of stimuli, it was shown to have had some impact on their attention. Their pattern of bias scores instead suggests evidence of 'attentional avoidance' of the offending stimuli.

Although past research has consistently found evidence that anxious individuals allocate attentional resources towards threatening stimuli (e.g. Mathews and MacLeod, 1994), recent studies suggest that individuals with low levels of trait anxiety but high levels of 'defensiveness' have a bias to allocate processing resources away from threatening stimuli (Mogg, Bradley, Dixon, Fisher, Twelftree, and McWilliams, 2000). It has been suggested that these 'defensive' individuals have a

defensive bias in selective attention i.e. a cognitive filter, or schema, which results in avoidance of negative or threatening cues (Bonanno and Singer, 1990). In the above studies, 'defensiveness' was determined by high scores on the Social Desirability Scale (SDS, Crowne and Marlowe, 1964). High SDS scores are deemed to reflect a high need for social approval, and reluctance to report negative emotional states. Findings support Eysenck's (1997) theoretical suggestion that attentional biases for threat-related information are influenced by more than one personality variable, including not only anxiety-proneness but also defensiveness.

It seems plausible to suggest that 'defensiveness' may also influence attentional processing in offenders. In a high security hospital environment, the potential for patients to produce socially desirable responses during assessment has been recognised (e.g. Marshall et. al., 2000). It is therefore possible that the offending stimuli may have triggered a defensive bias in some of the offenders' attention that resulted in the observed trend of 'attentional avoidance' of offending stimuli. It is possible that this 'attentional avoidance' framework could also explain the extreme negative bias scores shown by some individual participants for the stimuli related to sexual offending. Future research could examine this further by including a measure of 'defensiveness'.

4.4.1 Hypothesis Two Methodological Reflections

4.4.1.2 Selection of stimuli

Within the category of 'non-sexual offending' terms, there were arguably distinct sub-types of words: some words related to the process of conducting an offence, for example, *'attack'*, *'threaten'* and *'assault'*; some were labels an offender might be

given, for example, *'criminal'*, and *'perpetrator'*; while some were legal terms, for example, *'conviction'*, *'parole'*, *'solicitor'*, and *'lawyer'*. The reason this occurred was the necessity to produce enough terms, but it is possible that some of these words may have been more salient to some offenders than others.

4.5 Hypotheses Three and Four

To the researcher's knowledge this was the first time sexual offenders had been compared to non-offenders and non-sexual offenders in terms of how non-offending sexual stimuli impacts on their attentional processes. When compared as groups, sexual offenders were not seen to differ from male controls and non-sexual offenders in the way they attend to stimuli related to non-offending sexual behaviour. The distributions of scores between groups were observed to be similar, suggesting that most sexual offenders show similar bias scores to male controls. A few sexual offenders against adult women and non-sexual offenders showed relatively extreme bias scores to a degree that was not observed for controls. This demonstrates the heterogeneity of the samples. It might be interesting to look in more detail at the characteristics of these individuals in order to explore this further. All four groups showed non-significant biases away from the stimuli, the direction that would have been predicted by Geer and Manguno-Mire's (1996) 'Sexual Content Induced Delay'. This phenomenon would predict slower processing of target words that are sexual on the dot probe task.

For stimuli related to sexual anatomy, when the sexual offenders were combined their positive bias score towards the stimuli approached significance, suggesting that this set of stimuli captured their attentional resources. Researchers have suggested that

investigating differences between sexual offenders and non-offenders in how they process sexual information may enhance understanding of 'problematic' sexuality (e.g. Geer et. al., 2000), so this finding offers a promising step in that direction.

4.5.1 Hypotheses Three and Four Methodological Reflections

4.5.1.1 Selection of stimuli

It was important that the non-offending 'sexual' words were of the kind that offenders would be familiar with using. Consequently some 'taboo' words were included as stimuli. Attempts were made to match these with words of similar frequency of usage, but this was an estimate as no data was available for these terms. It is possible that 'taboo' words may have attracted attentional resources due to the novelty of seeing such words written down.

4.6 General Methodological Considerations

4.6.1 Stimuli

Previous attentional bias research in the field of emotional disorders has used computer programs that briefly present images salient to an individual's 'threat' schema rather than words, for example, threatening faces in anxiety; Bradley et. al, 1998). Within sexual offending populations, PPG examination has used images to assess sexual preferences by measuring changes in penile erection. It is possible that images salient to sexual offenders might capture attentional resources to a greater degree than words using dot probe methodology; it would be interesting to explore this in future research. There may be ethical implications to using images rather than verbal stimuli in the dot probe task however. Firstly there is the question of how salient stimuli related to sexual offending may be acquired in the first place, while

secondly it is possible that visual images may have more of an impact on the offending participants than verbal stimuli, and lead them to feel traumatised. These factors would need to be considered carefully if such research was to go ahead.

4.6.2 Participant bias

For the staff, 'non-sexual offending' and 'sexual offending against children' groups there was a high rate of consent from those individuals that were approached. However, for the 'sexual offenders against adult women' group the consent rate was just 50%. It is important to consider that those individuals (particularly those who had committed sexual offences against adult women) who chose to take part may not have been representative of all offenders within that group. It may be interesting to take a closer look at why the consent rate was so much lower for the sexual offenders against women. It is possible that those who chose not to take part are more reluctant to engage in other forms of assessment or treatment and thus may have more distorted cognitions than those that did agree to participate. More information on the non-consenters would be required to explore this further.

4.6.3 Selection of control group

The male staff control group may not be representative of the general population. They were selected because of their similarity in demographics, i.e. age and verbal abilities, and to control for whether findings may have been due to spending time in an environment where clinical material of an offending and sexual nature are commonly discussed. It is possible that a non-hospital control group who had not chosen to work in such an environment may have produced different findings.

4.6.4 Effect of mental illness

Some of the patients with mental illness had received a diagnosis of schizophrenia. Individuals diagnosed with schizophrenia have been found to have impairments in a wide range of cognitive tasks, including problems in sustaining attention and efficient information processing (Nelson, Pantelis, Carruthers, Speller, Baxendale and Barnes, 1990; Hemsley, 1994). This factor was considered but observation of response latencies suggested no reason to exclude any participants from the analysis on the basis of slowed reaction times.

4.6.5 Sample size

It is recognised that the current study had a relatively small number of participants within each group, and as a consequence the limitations of small-sample research are noted. With an increased sample size, variability of scores would have decreased (Norušis, 1997), and it is possible that significant findings between groups may have been found, particularly for the hypotheses for which the findings approached significance. However, this idea of increasing the sample size needs to be balanced against the limitations of a 'group comparison' approach when such individual differences exist within groups.

4.6.6 Generalisability of findings

The sample examined in the current study are detained in a high security hospital, and are therefore diagnosed as 'mentally disordered' under the terms of the Mental Health Act (1983). Most sexual offenders are housed in prisons or live in the community, and receive sex offender group treatment delivered primarily by prison officers and probation officers (Houston, Thomson and Wragg, 1994). Thus the majority of

offenders are not 'mentally disordered'; this clear distinction from the current sample means the study's findings can only be generalised with caution to offenders in the community.

4.7 Clinical Implications

This paper introduces a novel approach to the assessment of sexual offenders. Established methods of assessing sexual offenders (i.e. interviews and questionnaires) are often limited by their transparency in the sense that the socially desirable response is obvious to the offender. The dot probe paradigm has the potential to be developed into a clinical tool for assessment that is difficult to manipulate, and provides information about attentional processes that may help guide future cognitive interventions.

The dot probe paradigm could be clinically useful as an additional tool to enhance the process of risk assessment. For example, if an individual's self-report and behavioural presentation suggests a reduction in cognitive distortions yet their bias score on the dot probe task is at ceiling levels it may raise questions as to the validity of the self-report. Though the score on the dot probe paradigm would not be 'proof' that the offender is attempting to give a socially desirable report, the knowledge that attentional processes are biased in such a way could contribute to the risk assessment and guide future clinical interventions that may attempt to encourage patients to adopt a more normal attentional style. (Within the anxiety literature it has been suggested that if biases provoke anxiety states, it may be useful for anti-anxiety treatments to target them, Mogg et. al., 2000).

Although post cognitive therapy changes in attentional bias have been detected using the dot probe paradigm with anxious individuals (e.g. Mogg et. al., 1992), it is not apparent which are the key components of therapy that alter attentional processes. Within a forensic institution there may be the incentive and opportunity to develop clinical interventions that specifically address offenders' attentional processing.

The theoretical idea that a bias away from offending stimuli might be related to defensiveness and a need for social approval has clear implications within a forensic setting. If offenders are displaying such 'attentional avoidance' this might suggest that they are responding to other forms of assessment such as written questionnaires or clinical interview in a socially desirable manner. Knowledge of such an attentional pattern could therefore inform the broader clinical picture.

4.8 Research Implications

The current study is the first time the dot probe paradigm has been applied to an offending population and is therefore effectively a pilot study, with a number of methodological limitations. Given the potential clinical benefits of the dot probe paradigm, future research could build on this initial study, taking into account the methodological weaknesses highlighted.

A particular implication for future research is the strong suggestion that offenders, and sexual offenders in particular, are a heterogeneous population with considerable differences observed in the way individual offenders process and attend to stimuli related to offending. Future researchers should pay careful consideration to how offenders are categorised if a group-comparison approach is adopted and perhaps examine in closer detail what it is that distinguishes individual offenders.

Given the difficulties that exist with assessment tools in forensic settings and the potential clinical benefits of the dot probe paradigm, there is possibly more incentive to devote research effort into developing a better understanding of attentional bias, the mechanisms by which it operates, how it impacts on subsequent behaviour, and how it can be changed through intervention, within a forensic institution. There would seem to be research benefits if high security hospitals, prison systems, and community treatment services were to combine resources, as this would give access to increased numbers of sexual offenders of varying typologies and enable increased generalisability of findings.

4.9 Conclusions

The current findings do not provide evidence that sexual offenders as a group demonstrate attentional biases towards certain sets of stimuli hypothesised to be salient to the content of their 'schemata related to offending', but there are promising signs that the attentional processes of sexual offenders, and offenders in general, may differ from non-offending controls. There is limited evidence that sexual offenders differ from non-offending controls in the way they attend to non-offending sexual stimuli.

Considerable differences were observed in the attentional bias scores for individual offenders, suggesting that offenders, and sexual offenders in particular are a heterogeneous group. This has implications for future research, in which a more individualised approach to comparing sexual offenders is recommended. The individual differences observed also have implications for the potential clinical use of dot probe assessment. It would not be safe to label offenders on the basis of their performance on the dot probe task, as the results of the current study are far from conclusive. However the knowledge that the stimuli used in the task leads some individuals to show a strong attentional bias towards or away from the stimuli could inform clinical interventions on a case-by-case basis.

There are clear methodological limitations of this pilot study, particularly with regards to how the stimuli used in the experimental task were chosen and presented, and the difficulties in generalising findings from a population of mentally disordered sexual offenders to the much greater numbers of sexual offenders who are not detained in high security hospitals. Future research (ideally in various forensic settings, including prisons and community services) could learn from these limitations to develop the dot probe paradigm as an objective, difficult to manipulate assessment tool.

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APPENDICES

Appendix One	Letter to clinical teams to request permission to approach patients on their wards
Appendix Two	Target words used as stimuli in probe detection task
Appendix Three	Target words and matched words used as stimuli in the probe detection task
Appendix Four	Neutral word pairs used for practice and in buffer trials in the main experiment
Appendix Five	BDI-II
Appendix Six	STAI
Appendix Seven	Mill Hill Synonym Scale
Appendix Eight	Information sheets given to potential patient and control participants
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Appendix One

Letter to clinical teams to request permission to approach patients on their ward

RMO [name] Ward

[Date]

INVESTIGATING ATTENTIONAL BIAS IN MALE SEXUAL OFFENDERS

Dear Dr

As part of my Doctorate Training in Clinical Psychology I am interested in carrying out a study to investigate whether offenders show an attentional bias towards words that are related to offending. The project has been approved by the Ethics Committee and is being supervised by , Clinical Psychologist.

Previous studies have found that individuals with mood disorders show an attentional bias towards words related to their underlying cognitive concerns. Attentional bias has not previously been studied in forensic populations but it is hypothesised that offenders will demonstrate a bias towards words that relate to their cognitive concerns regarding offending. There is potential for the attentional bias task to be developed as an objective tool for assessment and for evaluating therapeutic change.

Procedure

Patients will be asked to participate in a computerised task called the dot-probe paradigm. Before that, three self-report measures will be administered to examine their mood, current feelings of anxiety and verbal IQ.

The computer task (which is a well-established test) involves flashing up pairs of words (one target word and one neutral word) briefly on a computer screen. A small dot then appears in the spatial location of one of the words and the participant is asked to press a button as soon as they see the dot. The target word will be from one of five categories; the words will relate to sexual offending, sexual anatomy, non-offending sexual behaviour, non-sexual offending, and travel (a neutral category). The neutral word will be matched with the target word for word length and frequency of usage in the English language. The theory is that response times will be quicker when the dot follows a target word as the salient word is said to attract disproportionately more processing time.

The whole procedure, including the self-report measures, will take thirty minutes. The computer task is programmed onto a 'lap-top' so participants can be tested on their ward.

I am interested in testing offenders who have committed sexual offences against adult women and children and offenders who have not committed sexual offences. I have

produced information and consent forms for participants that have been approved by the Ethics Committee. The results for each participant will remain confidential unless the participant wishes to share them with the clinical team. If they choose to do this, a brief report will be produced and submitted to the clinical team.

After consulting the psychology department to identify possible participants, I am seeking your permission to approach [names] on [name] Ward to ask if they would like to participate in the study. For those patients you feel able to give consent for me to approach I will make an appointment to discuss the research. Due to the methodology I can only give limited information to participants before the start of the task, although a full briefing will be given afterwards.

Please reply to me at the Psychology Department at your earliest convenience. I am happy to meet with your clinical team should you require any further information. Many thanks in advance for your support.

Yours Sincerely

Trainee Clinical Psychologist
Ext.

Supervised by:

Clinical Psychologist
Ext.

cc.
Link Psychologist, [name] Ward

Appendix Two

Target words used as stimuli in probe detection task

'Non-sexual offending' words	'Sexual offending' words
assault attack violence criminal conviction prison arrested perpetrator accused offence victim punishment lawyer police prosecute guilty solicitor threaten parole harm	rape grope molest paedophile incest indecent obscene coerce deviant sadist masochist abuse . lure pervert voyeur nonce bondage violate sodomy buggery
'Non-offending sexual behaviour' words	**'Sexual anatomy' words**
intercourse sex caress seduction masturbate fucking climax ejaculation cunnilingus penetration orgasm kissing blow-job missionary love-making orgy fondling licking sucking stroking	genitals vagina bum erection foreskin pussy tits hard-on breasts scrotum penis clitoris nipples cunt fanny dick balls cock arse boobs
'Travel' words	
pilot canal route vessel voyage runway driver airport balloon holiday stewards shipping suitcase explored vacation passport traveller aeroplane caravan reservation	

Appendix Three

Target words and matched neutral words used as stimuli in the probe detection task (including their frequencies)

Non-sexual offending words

	BVF[1]	K-FWF[2]		BVF	K-FWF
Assault	-	15	Mileage	-	15
Attack	13	105	Income	14	109
Violence	-	46	Diameter	-	45
Criminal	1	24	Magnetic	1	25
Conviction	1	50	Employment	1	47
Prison	3	42	Varied	3	42
Arrested	2	-	Yachting	2	-
Perpetrator	-	1	Aerodynamic	-	1
Accused	1	-	Baffled	1	-
Offence	-	-	Carrots	-	-
Victim	-	27	Butter	1	27
Punishment	-	21	Dedication	-	21
Lawyer	1	43	Decade	1	46
Police	9	155	Market	9	155
Prosecute	-	2	Acrobatic	-	2
Guilty	3	29	Studio	4	31
Solicitor	1	6	Carpenter	1	6
Threaten	-	11	Facility	-	11
Parole	-	5	Fisher	-	5
Harm	3	25	Tail	3	24

[1] BVF means Brown Verbal Frequency

[2] K-FWF means Kučera-Francis Written Frequency

Sexual offending words

	BVF	K-FWF		BVF	K-FWF
Rape	1	5	Menu	1	5
Grope	-	1	Camel	-	1
Molest	-	1	Grocer	-	1
Paedophile	-	-	Calculator	-	-
Incest	-	13	Pepper	-	13
Indecent	-	5	Planting	-	5
Obscene	1	2	Yawning	1	2
Coerce	-	2	Shrimp	-	2
Deviant	-	3	Blister	-	3
Sadist	-	1	Loader	-	1
Masochist	-	-	Bluebells	-	-
Abuse	-	18	Ridge	-	18
Lure	-	7	Herb	-	7
Pervert	-	-	Borders	-	-
Voyeur	-	-	Alpine	-	-
Nonce	-	1	Zebra	-	1
Bondage	-	3	Emerald	-	3
Violate	-	7	Bargain	-	7
Sodomy	-	-	Discus	-	-
Buggery	-	-	Anthill	-	-

Non-offending sexual behaviour words

	BVF	K-FWF		BVF	K-FWF
Intercourse	-	9	Atmospheric	-	10
Sex	8	84	Add	8	88
Caress	-	1	Citrus	-	1
Seduction	-	3	Celebrity	-	3
Masturbate	-	-	Icebreaker	-	-
Fucking	7	-	Scripts	7	-
Climax	-	14	Sunset	-	14
Ejaculation	-	-	Businessman	-	-
Cunnilingus	-	-	Obstruction	-	-
Penetration	1	15	Philosopher	1	15
Orgasm	-	7	Hamlet	-	7
Blow-job	-	-	By-roads	-	-
Missionary	1	17	Stretching	1	17
Love-making	-	-	Deep-frozen	-	-
Fondling	-	-	Broadest	-	-
Kissing	-	6	Compose	-	6
Orgy	-	1	Soot	-	1
Licking	1	1	Dolphin	1	1
Sucking	1	8	Crusade	1	8
Stroking	-	2	Postmark	-	2

Sexual anatomy words

	BVF	K-FWF		BVF	K-FWF
Genitals	-	-	Floodlit	-	-
Vagina	-	10	Sewing	-	10
Bum	1	7	Ink	1	7
Erection	-	5	Premiere	-	5
Foreskin	-	-	Fishtail	-	-
Pussy	-	5	Flask	-	5
Cock	3	5	Bump	3	5
Hard-on	-	-	Back-up	-	-
Breasts	-	-	Agendas	-	-
Scrotum	-	-	Benches	-	-
Penis	-	-	Dawns	-	-
Clitoris	-	-	Muddiest	-	-
Nipples	-	-	Cookery	-	-
Cunt	-	-	Bike	-	-
Fanny	-	-	Caves	-	-
Dick	-	18	Lamp	-	18
Balls	-	-	Barks	-	-
Tits	-	-	Doze	-	-
Arse	1	-	Twig	1	-
Boobs	-	-	Acorn	-	-

Travel words

	BVF	K-FWF		BVF	K-FWF
Pilot	1	44	Rapid	1	43
Canal	4	3	Choir	4	8
Route	2	43	Skill	3	42
Vessel	1	16	Occupy	1	16
Voyage	-	17	Deputy	-	17
Runway	-	4	Braces	-	4
Driver	2	49	Lights	2	47
Airport	3	19	Rolling	3	19
Balloon	-	10	Mercury	-	10
Holiday	19	17	Sixteen	20	20
Stewards	1	-	Antiques	1	-
Shipping	-	19	Earnings	-	19
Suitcase	1	-	Cartoons	1	-
Explored	1	-	Penguins	1	-
Vacation	2	47	Purchase	3	47
Passport	-	6	Stairway	-	6
Traveller	-	3	Gardening	-	3
Aeroplane	1	-	Creatures	1	-
Caravan	-	8	Diamond	-	8
Reservation	-	8	Everlasting	-	8

Appendix Four

Neutral word pairs used for practice and in buffer trials in the main experiment (taken from previous research, Murphy, 1993)

Neutral word pairs used in practice trials

USEFUL	-	SUPPER
ALERT	-	LODGE
HARVEST	-	ITEMISE
TOKEN	-	CRUMB
APPLE	-	PRICE
PARCEL	-	POODLE
CHEESE	-	MARROW
JEWEL	-	RIVER
BATTERY	-	REALISE
TEAPOT	-	GUITAR

Neutral word pairs used in buffer trials in main experiment

MUSIC	-	WATER
COMMON	-	FAVOUR
MIRROR	-	TARTAN
STYLE	-	BOARD

Appendix Eight

Information sheets given to potential patient and control participants

Information Sheet (for patients)

My name is [ ]and I am a Trainee Clinical Psychologist studying in Oxford. As part of my final year of the training course I have to complete a dissertation that involves me carrying out a research project.

I am currently working at [ ] with [ ] (Clinical Psychologist) and I am keen to conduct a research project during this placement.

The project I have in mind involves looking at how individuals in forensic hospitals process different kinds of words. Previous research has suggested that finding out how individuals process words can provide useful information for assessment and treatment. I cannot give too much information before carrying out the tests because it may interfere with the individual's performance. However I would be happy to talk about it in more detail afterwards.

The project would involve me meeting individuals on their ward and spending a few minutes going through a computer program with them. The program involves me showing different words on the computer screen, some of which will be immediately followed by a small dot. The task requires the individual to press a button as quickly as possible after seeing the dot. Some of the words that are shown may or may not reflect types of offending and might be offensive to some people. I will also ask the individual to complete three short questionnaires and the whole process should take no longer than 30 minutes.

The performance of individuals on the computer program will remain confidential and will only be used for the purposes of the research project. The only exception to this would be if any particular individual would like their results to be shared with the clinical team. If the individual decides that they would like their results to be shared with the clinical team I will send a results form to their Responsible Medical Officer and it will be included in their records following the completion of the task. I will be happy to give any individual participating in the study further information about the project following their participation.

In order for me to carry out this project I would be grateful for the help of individuals who are currently living at [ ]. Participation in the study is optional. **Should you or should you not choose to take part in the study you can be assured that your future treatment will in no way be affected.**

Thank you very much

Trainee Clinical Psychologist Clinical Psychologist

Information Sheet (for staff controls)

I am a Trainee Clinical Psychologist studying on the Oxford Doctoral Course in Clinical Psychology. As part of my final year of the training course I have to complete a dissertation which involves me carrying out a research project.

I am conducting this research project at [ ]under the supervision of [ ] (Clinical Psychologist).

The project I have in mind involves looking at how individuals in forensic hospitals. process different kinds of words. Previous research has suggested that finding out how individuals process words can provide useful information for assessment and treatment. I cannot give too much information before carrying out the tests because it may interfere with performance. I will, however, be happy to discuss the study in more detail following participation. I will be unable to give feedback regarding individuals' performance on the task but assurances are given that all data will remain confidential and only be used for the purposes of the current study.

The procedure requires me to show a number of different words on a computer screen, some of which will be immediately followed by a small dot. The task involves pressing a button as quickly as possible after seeing the dot. Some of the words that are shown may or may not reflect types of offending and might be offensive to some people. I will also ask the individual to complete three short questionnaires and the whole process should take no longer than 30 minutes. As the computer program is on a 'lap-top' the task can be conducted at a place that is convenient for the participant.

As well as conducting this task with forensic patients at [ ] I also need to carry out the procedure with non-forensic control participants so that I will be able to compare the findings.

I am therefore looking for a number of volunteers to help me with this task. If you would like to participate please complete the following consent slip.

Thank you very much

Trainee Clinical Psychologist Clinical Psychologist

Appendix Nine

Consent forms given to patient and staff participants

Consent Form (for patient participants)

Participation in the above study is optional. **Should you or should you not choose to take part in the above study you can be assured that your future treatment will in no way be affected.**

I would/would not like to participate in the above research project.

I would/would not like my results to be shared with the clinical team.

Signed ----------

Date ----------

Trainee Clinical Psychologist Clinical Psychologist

Consent Form (for staff participants)

I would/would not like to participate in the above study.

Signed ----------

Date ----------

Trainee Clinical Psychologist Clinical Psychologist

Appendix Eleven

Attentional bias scores for individual participants in each of the four participant groups for each of the five sets of stimuli

Male members of staff

	Stimuli related to non-sexual offending	Stimuli related to sexual anatomy	Stimuli related to non-offending sexual behaviour	Stimuli related to sexual offending	Stimuli related to travel
N1	-48.6	-38.4	+55.1	+32.9	+13.9
N2	-5.2	-26.3	-17.7	-7.22	+9.3
N3	-24.1	+10	+34.2	+22	-1.5
N4	+1.7	-36.3	-48.6	-39.2	-40.8
N5	+71.3	-95.9	-5.8	-17.6	-23.3
N6	+3.6	-49.3	+24.5	-54.2	+71
N7	-2.5	-6.9	-9.9	-14.5	+23.4
N8	-18.9	+45.03	-14.9	+65.3	+24.1
N9	+77	-140.3	-7.13	-56.1	-81.9
N10	-20.3	-6	+30.3	-82.8	-17.9
N11	-13.88	+169.9	-42.6	+33.2	-109.2
N12	-19.9	+5.5	+7.2	+33	-43.4
N13	+13	-14.1	-.72	-16.6	+14.82
N14	+72.4	+8.5	-1.8	+32.5	+15.7
N15	-35.9	-24.57	-8.8	+70.05	+1.7

Sexual offenders against children

	Stimuli related to non-sexual offending	Stimuli related to sexual anatomy	Stimuli related to non-offending sexual behaviour	Stimuli related to sexual offending	Stimuli related to travel
N1	-295.73	+72.27	-34.82	-53.48	-60.55
N2	-117.7	+101.1	+22.85	+39.82	-44.05
N3	-74.8	+73.4	+6.9	-26	+14.9
N4	+4.7	-22.5	-57.6	-2.4	-15.55
N5	+50.5	+4	+27.5	-5.05	+2.22
N6	-51.89	+48.75	+8.3	+59.72	-11.3
N7	-.3	+44.55	-59.88	+92.7	+2.67
N8	-9.2	-83.3	+20.5	+4.97	+96.6
N9	-15.8	+69.7	-81.5	+19.9	+53.3
N10	-25.2	-23.7	-33.9	+27.9	-.7
N11	+33.58	+1.03	-5.63	+90.3	+7.1
N12	-73.8	-76	+58.5	-72.2	-16
N13	+74.8	-101.1	+14.5	+106.2	-20.7
N14	-7.5	+41.58	-.8	+62.35	+45.2
N15	+7	-95.4	-.1	-24.5	-17.8

Sexual offenders against adult women

	Stimuli related to non-sexual offending	Stimuli related to sexual anatomy	Stimuli related to non-offending sexual behaviour	Stimuli related to sexual offending	Stimuli related to travel
N1	+12.8	+24.1	-80.6	+4.2	+26.5
N2	+67.13	+62.79	+190.92	+348.33	+81.38
N3	-58.93	+13.5	+42.8	-53.35	+115.1
N4	-217.92	+176.7	-183.35	+259	-9.1
N5	71.62	+148.7	+63.8	+9.5	-59
N6	-220.6	+60.3	-139.8	-174.4	+107.3
N7	+31.1	-4.15	+17.78	+53.8	+40.1
N8	-48.8	-28.2	-76.1	-3.55	+9.92
N9	-42.8	+3	+42.4	+3	-31.9
N10	-89.48	+93.5	-78	+195.7	+23.4
N11	-4.7	+2.1	+35.2	-2.7	-75.6
N12	-14.3	-17.7	-86.9	-47.3	-42.9
N13	-81	+26.5	-.5	0	-49.6
N14	-25.7	+41.5	+70.95	+21.4	-22.5
N15	-18	+55.2	-52.6	-195.6	+38.6

Non-sexual offenders

	Stimuli related to non-sexual offending	Stimuli related to sexual anatomy	Stimuli related to non-offending sexual behaviour	Stimuli related to sexual offending	Stimuli related to travel
N1	-27.5	-74.37	-60.7	-4.4	-28.7
N2	-15.1	+6.2	+53.2	+18.9	+26.9
N3	+24.9	+27.8	+1.75	+57.9	+7.38
N4	-2	+9.2	-112.1	-50.6	-48.9
N5	+22.82	+3.75	+13.8	+39.17	+29.6
N6	+24.2	+52.4	-90	+179.6	-146.1
N7	-17.8	-7.9	-25.4	-8.4	-42.8
N8	-73.8	+62.1	+21.8	-31.8	+71.9
N9	+33.18	-129.5	-11.02	-63.38	+24.05
N10	+37.2	+60.93	+27.5	+.6	+44.8
N11	-51.2	-42.57	-30.15	+42.13	-68.53
N12	-20.5	+18.4	-25.1	+16.1	-8.6
N13	-239.7	-58.4	+2.77	+119.1	+296.5
N14	-61.4	+46.1	+126.13	-24.8	-25.2
N15	+35	+128.07	+27.5	+108.6	-57.5